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ABSTRACT

Five products are combined here that were developed by a project designed to provide a continuous, competency-based line of vocational training. A policies and procedures guide contains recommendations for future articulation efforts between secondary and postsecondary, public, vocational training institutions. Its contents cover the concept of articulation; a description of the Occupational Education Articulation Program organization; a discussion of the articulation process; implementation of articulation; format of the articulated, performance-based instruction objectives guides for various vocational training programs that were also developed by the project; guidance and admissions considerations for advanced placement considerations; secondary guidance procedures for use of the proficiency report; postsecondary admission of applicants; and proficiency reporting. Potential inhibitors of articulation are identified, and recommendations are made for successful articulation. Appendixes include sample guide pages and project materials. The second product, an introductory guide, is intended as an introduction to the Occupational Education Articulation Program. It is also a reference to instructional guide development and use. The remaining products are three workshop guides providing materials on (1) "Suggestions for Conducting a Task Analysis and Some Sources of Ready-made Task Lists and Objectives for Competency-based Vocational Education"; (2) "Preparing Objectives, Performance Actions, and Standards for Articulated, Performance-Based Instruction"; and (3) "Developing Outcome-referenced Tests." (YLB)

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PRELIMINARY DOCUMENT
POLICIES AND PROCEDURES FOR ARTICULATION

Project No. 81-1708
Contract No. ARC 211-B

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POLICIES AND PROCEDURES GUIDE FOR ARTICULATION OF OCCUPATIONAL EDUCATION PROGRAMS BETWEEN THE SCHOOL DISTRICT OF GREENVILLE COUNTY AND GREENVILLE TECHNICAL COLLEGE

Revised June, 1983

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Occupational Education Articulation Program
Funded in part by
SOUTH CAROLINA APPALACHIAN COUNCIL OF GOVERNMENTS

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ABSTRACT

Title of Project: Occupational Education Articulation Program

Project Coordinator: Wm. Edward Henderson, Jr.

Contracting Agency: The School District of Greenville County
301 Camperdown Way
P. O. Box 2848
Greenville, South Carolina 29602

Project Period: March 1, 1981, through June 30, 1983

PURPOSE: To develop a continuous program of vocational training in similar vocational programs so that students may continue their education at the secondary and post-secondary levels without loss of time or waste of effort in repeating tasks that have been mastered previously.

To provide a system whereby teachers can cooperate effectively in providing a continuous occupational development program where the level and type of training that leads to entry-level employment skills will be clear to students, teachers, other educators, and employers.

METHOD: Teacher representatives from fourteen high schools and four secondary vocational education centers of secondary level vocational programs of The School District of Greenville County, and instructor representatives from participating departments of the post-secondary level programs at Greenville Technical College were brought together in task force committees and workshops to survey very similar vocational programs of training to identify possible overlap or gaps which might be encountered by students as they continue their vocational education from the secondary level to the post-secondary level. In addition, there was interest in lateral articulation of similar programs at the secondary level. Articulated, performance-based (competency-based) instruction objectives guides were developed by the task force committees to facilitate articulation. Using the task analysis process, the task force committees identified the competencies essential for

A student desiring to continue training in a similar vocational area or for initial entry into the labor market in the field of training or a related field. Major objectives or competencies were stated, performance to obtain the objectives were identified and placed in sequential order, instruction time was estimated, and performance standards were stated. Finally, outcome-referenced (criterion-referenced) measures of competency were developed for use as a guide in articulation. The program coordinator served as a technical writer and vocational education curriculum specialist.

EXECUTIVE COMMITTEE:

Because the Program involved important joint decisions between The School District of Greenville County, the secondary level, and Greenville Technical College, the post-secondary level, concerning advanced credit or placement and methods of communications, a governing board, the Executive Committee, was established to provide the necessary structure for coordinating the Program through the two institutions. The Executive Committee consisted of the chief administrative officers of the two institutions, staff administrators responsible for curriculum, vocational education center unit administrators, and others.

ADVISORY COMMITTEE:

An Advisory Committee was established so that representatives from the participating institutions and industry might participate in the formulation of the Program. The Advisory Committee primarily functioned as a sounding board to determine completion requirements for job entry skill training and to provide current data about industry manpower needs, new techniques, and equipment trends.

RESULTS:

As a result of Program activities during the initial year, March, 1981, to June, 1983, the document titled *Policies and Procedures for Articulation* was developed. Products emerging from the work of the task force committees were the *Articulated, Instruction Objectives Guide for Business and Office Education* which included as its components, articulated curriculum guides for Typewriting, Shorthand, Accounting, Office Procedures, and Business English; *Articulated, Performance-based Instruction Guide for Automotive Mechanics*; *Articulated, Performance-based Instruction Guide for Carpentry*; *Articulated Performance-based Instruction Guide for Drafting* (Drafting I, Drafting II: Architectural, Structural, and Mechanical options); *Articulated, Performance-based Instruction Guide for Food Service*; and *Articulated, Performance-based Instruction Guide for Welding*. The articulated instruction guides are not end products since they must be field trial tested and revised. Modifications and improvements to the guides are expected since the process of education must be continually improved to ensure that objectives are valid and that they are being met as best they can be met under given conditions.

Based upon the experiences in developing the initial articulated, performance-based instruction objectives curriculum guides, the recommendations of the task force committee, the Advisory Committee, the Executive Committee, curriculum specialists, as well as input from teachers who will use the articulated curriculum guides, the Policies and Procedures for Articulation document was developed.

As sub-products of the Program, two additional documents were assembled to aid participants, administrators, or other articulated vocational training programs or develop performance-based curriculum material. A Workshop I Guide (Writing Performance Objectives, Actions, and Standards) concerned how to describe programs, identify and write objectives, state performance actions to reach the objectives, and write standards based on the performance necessary for successful employment in the local or regional labor market. The Workshop II Guide (Writing Outcome-referenced Measures) was a continuation to the first workshop guide and delt with recommendation on writing outcome-referenced (criterion-referenced) test items. Both guides contained how-to-do-it "handout" sections to aid teacher participants in writing performance-based materials. In addition, master copies of the workshop guides contained suggested workshop schedules, agendas, recommended time schedules for developing articulated, performance-based material, theoritical and practical reference material for workshop leaders, and an extensive state-of-the-art bibliography.

PREFACE

The Occupational Education Articulation Program as represented in the Policies and Procedures Guide for Articulation and the articulated, performance-based instruction guides was compacted into a period of approximately two years due to the project beginning later than initially planned and due to the loss of federal funding for the program. The program goals were adjusted so they might be accomplished within the available time frame of the project. The compacting of the development time emphasized the need to limit the scope of the curriculum areas to selected vocational programs where there was tentative agreement among the participating institutions that students continuing their training beyond the secondary level could exempt post-secondary training if they demonstrated competency in the performance of articulated skills taught at the secondary level.

A number of similar articulation projects surveyed articulated from the post-secondary level to the secondary. The Occupational Education Articulation Program, a joint effort of the secondary and post-secondary participants, represents instructional articulation from the secondary level. The articulation guides are based on the requirements of the South Carolina Department of Education for secondary level training, existing and proposed curriculum materials from the State, recommendations of the task force committees representing the secondary and post-secondary institutions, and on the areas of similar training or training overlap.

Often, many articulation project products are isomorphic...a checklist of final performance. A goal, within the available time of this project, was to develop instructional products that stated objectives, outlined performance actions, clarified standards to measure performance, included outcome-referenced measures, and stated other information that might be appropriate for lateral and vertical articulation of similar training.

It was not feasible, within the initial time frame of the project, to structure the performance actions to reach the objectives or to refine outcome-referenced tests so that they would conform fully to theories concerning the sequencing of instruction as found in works by Gagne' and Bloom; in Teaching Machines and Programmed Instruction II, by Robert Glasser, ed; and in current literature concerning writing objectives for the affective domain. As the instruction guides are revised in the future, the sequence of learning or job actions should receive additional attention.

The Policies and Procedures Guide for Articulation is based on those accepted concepts that have been discovered by others working in articulation; by the recommendations of the task force committees, Advisory Committee, and Executive Committee of the Articulation Program; and on the recommendations of others who have been so kind as to offer suggestions. The Policies and Procedures Guide for Articulation is designed according to what worked successfully during the initial year of this program and is the recommended policies and procedures for future articulation efforts.

In writing the Policies and Procedures Guide for Articulation, it was helpful to refer to the Policies and Procedures Guide for the Articulation of Vocational/Occupational Education Programs between North Carolina Public High School and Community Colleges/Technical Institutes, by Carlyle P. Woelfer, Raleigh, NC: North Carolina State Department of Education, 1978. The North Carolina articulation guide was a valuable resource that saved us time by providing proven guideposts as the Policies and Procedures Guide for Articulation for this program was written.

Every effort has been made to develop this Policies and Procedures Guide for Articulation so that it may be exported to assist others in articulation projects as well as guiding activities of the Occupational Education Articulation Program.

The instruction guides of the Occupational Education Articulation Program resulted from the contributions of the task force committee participants who were cooperative and hardworking during the project. It was a pleasure to work with participants who adapted quickly to generating instructional objectives for specific jobs, working from performance desired or recommended by industry to curriculum development. This approach to training objectives development, opposite to the traditional method of generating objectives from content, helped ensure the validity of the curriculum objectives and content in the performance-based instruction guides.

The performance-based instruction guides are designed to function as a framework for lateral and vertical articulation and to serve as a reference guide for vocational instruction guides articulated in the future. At best, however, the articulated, performance-based instruction guides are developing documents and the initial editions are approximations which will be improved upon after initial field testing.

Using the existing articulated instruction guides, the Policies and Procedures Guide for Articulation, and the two workshop guides, department heads, school principals, or others shoud be better prepared to coordinate articulation or performance-based instruction development activities in the future.

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THE SCHOOL DISTRICT
OF GREENVILLE COUNTY

GREENVILLE TECHNICAL COLLEGE

TO: All Administrators, Staffs and Faculties, The School District of Greenville County and Greenville Technical College

SUBJECT: Application and Implementation of the Policies and Procedures for the Articulation of Similar Vocational Training Programs of Instruction

Since 1976, The School District of Greenville County and Greenville Technical College have been working toward making the articulation of vocational education programs a viable and valid reality. Through joint efforts in the Occupational Education Articulation Program, The School District of Greenville County and Greenville Technical College fully support the concept of articulation and agree upon the purposes of the articulation program.

This Policies and Procedures Guide has been developed as a joint effort of The School District of Greenville County and Greenville Technical College with the assistance of individuals representing the institutional administrative units, involved faculty, and the local business and industrial community. The Policies and Procedures Guide is designed to assist the articulation of very similar programs of vocational training between the secondary and post-secondary, public, vocational training institutions in Greenville County.

Appreciation is expressed to participants at both institutions for the joint effort of this endeavor.

J. F. Hall

J. F. Hall
Superintendent
The School District of
Greenville County

Thomas E. Barton

Thomas E. Barton
President
Greenville Technical College

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PRELIMINARY DOCUMENT

Project No. 81-1708
Contract No. ARC 211-B

POLICIES AND PROCEDURES GUIDE FOR ARTICULATION OF OCCUPATIONAL EDUCATION PROGRAMS BETWEEN THE SCHOOL DISTRICT OF GREENVILLE COUNTY AND GREENVILLE TECHNICAL COLLEGE

(Pilot Model)

PREPARED BY
THE EXECUTIVE COMMITTEE,
THE ADVISORY COMMITTEE,
AND TASK FORCE COMMITTEES
OF THE
OCCUPATIONAL EDUCATION ARTICULATION PROGRAM
REPRESENTING
THE SCHOOL DISTRICT OF GREENVILLE COUNTY
AND
GREENVILLE TECHNICAL COLLEGE
GREENVILLE, SOUTH CAROLINA

PROJECT PERIOD

March, 1981 - June, 1983

OCCUPATIONAL EDUCATION ARTICULATION PROGRAM
FUNDED IN PART BY
SOUTH CAROLINA APPALACHIAN COUNCIL OF GOVERNMENTS

Revised, June, 1983

OCCUPATIONAL EDUCATION ARTICULATION PROGRAM

INTRODUCTION

ARTICULATION

Articulation is the joining or interrelating of two or more levels of education, secondary and post-secondary or vocational and technical, in order that very similar programs form a continuous progression of sequential, unduplicated training.

Articulation provides a system whereby teachers can cooperate effectively in providing instruction to meet the needs of individual students in order that there will be no unnecessary gaps or overlap in student learning, and where the levels and types of training lead directly to entry-level employment skills.

Vocational articulation, in short, is a clear expression and joining of two similar levels of career training into a continuous sequence to benefit students, educators, employers, and taxpayers.

THE ARTICULATION PROGRAM

Articulation of secondary and post-secondary vocational training programs has been discussed in educational circles for many years. In recent years, articulation has become the subject of nationwide concern as well as positive effort. In South Carolina, secondary and post-secondary level vocational administrators have taken a supportive position for articulation since the mid-1970s. Vocational articulation programs now are underway in several locations in South Carolina.

The concept of articulation and the articulation program are supported fully by The School District of Greenville County and Greenville Technical College which agreed upon a statement of purpose for articulating the various vocational programs in Greenville County. Since 1976, they have been working toward this goal. Thus, this articulation program is a joint effort of The School District of Greenville County and Greenville Technical College with the purpose of developing a continuous program of vocational training so that students may continue their education without loss of time or waste of effort in repeating tasks which have been learned previously. This articulation program will help to remove unnecessary gaps or overlap in student learning which sometimes occurs when the student completes a secondary level program and continues career development at the technical education level.

Articulation provides a system whereby teachers and instructors can cooperate effectively in providing a continuous occupational development program where the level and type of training that leads to entry-level employment skills will be clear to teachers and instructors, other educators, students, and potential employers.

In addition to the educational benefits resulting from an articulated vocational training program in Greenville County, taxpayers will benefit through a reduction in the cost that is required to train students for entry-level employment.

ARTICULATION COORDINATOR

The articulation coordinator and the articulation program are funded largely through a federal grant to The School District of Greenville County through the South Carolina Appalachian Council of Governments. The coordinator reports to the School District's Consultant for Vocational Education.

The articulation coordinator is responsible for the overall planning and sequential implementation of articulation efforts between The School District of Greenville County and Greenville Technical College. The sequential implementation is structured so that designated programs which are very similar in nature are "articulated" and evaluated, the articulation process is modified (if necessary), and other programs are brought into the articulation process.

To facilitate articulation, the coordinator works cooperatively with administrators, teachers and instructors, counselors, and job placement coordinators on both the secondary and post-secondary levels as well as with business, industry, and the general public.

The coordinator is assigned the tasks of providing leadership in planning curriculum development, articulation agreements, resource development, and evaluation of articulation.

INITIAL PROGRAM OBJECTIVES

Objective 1. Drafting and Business and Office Education courses at the secondary level and similar training at the post-secondary level were modified into performance-based modules.

Objective 2. Performance tests over each Business and Office Education and Drafting module were developed. The outcome-referenced test may include a written examination on the theory and knowledge of the area of instruction and a proficiency test of application of knowledge obtained.

Objective 3. The predictive validity of the tests over the Business and Office Education and Drafting modules is being determined in order that meaningful and accurate scores reflecting competency in the areas tested can be determined.

PUTTING ARTICULATION INTO ACTION

For initial implementation of the articulation program, Drafting and Business and Office Education were chosen as pilot programs. Drafting training articulation involves courses at four vocational education centers within the school district as well as at Greenville TEC. Business and Office Education involves courses at two vocational education centers, fifteen high schools, and Greenville TEC. During the second year of the project, Automotive Mechanics, Carpentry, Drafting II, Food Service, and Welding vocational programs were added to the articulation program.

To bridge any gaps that might exist between secondary and post-secondary vocational training and to strengthen the sequence of occupational training available to students, there must be (1) contact, (2) communications, (3) coordination, (4) cooperation, (5) consolidation and, of course, (6) articulation between instructional participants at both levels of training.

Among program participants, there must be: (1) agreement on purpose, (2) trust, (3) respect, (4) a willingness to take risks, and (5) a willingness to experiment. The articulation process began with statements of support from top management of The School District of Greenville County and Greenville Technical College. Implementation of the articulation program is under way and the final step will be the evaluation of program effectiveness.

Those things which were accomplished during the initial stage include:

1. Existing curriculum content in Business and Office Education and Drafting was revised into performance-based modules.
2. Scope and sequence of module instruction were established.
3. Cognitive and proficiency tests were developed.
4. "Tryout" testing of cognitive and performance tests was initiated.

Those things which can be accomplished after the initial year include: (1) pilot implementation of performance-based modules, and (2) full validation of cognitive and performance tests.

ARTICULATION IS NOT WITHOUT WORK

Articulation cannot take place without the implementation of performance-based instruction.

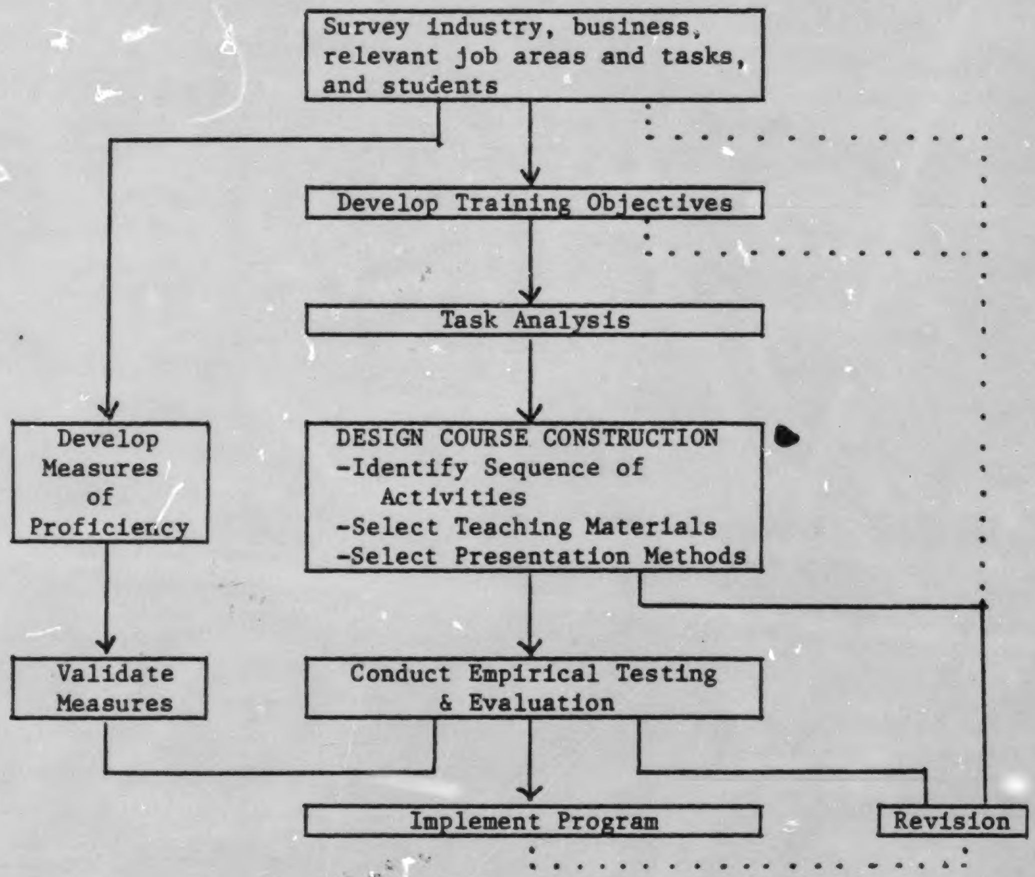
Performance-based instruction requires each student to master the vocational curriculum material at a level of proficiency necessary for success in entry level employment in the local labor market.

Everything in a performance-based instruction system is made public before instruction. There are no surprises for students, teachers, administrators, or employers. When the student begins a program, information is available to tell the student exactly what competencies are expected to be developed as a result of the instructional program, how the student will be evaluated and against what standards or criteria, and how the student's competencies will be communicated to the student, to other instructors, and to future employers.

Developing performance-based instruction guides takes time and work. Program goals must be identified. Vocational training must be made more relevant to actual job tasks. The training or job environment, the equipment needed, and factors acting upon the student must be spelled out. Furthermore, outcome-referenced measures must be developed to demonstrate the student's mastery in knowledge and skill performance.

A SYSTEM FOR INSTRUCTION

A performance-based instruction system tells a student exactly what the student must learn, instructs the student in that skill or knowledge, and then tests on mastery of that specific competence.


Survey industry, business, relevant job areas and tasks, and students
Develop Training Objectives
Task Analysis
Develop Measures of Proficiency
DESIGN COURSE CONSTRUCTION
-Identify Sequence of Activities
-Select Teaching Materials
-Select Presentation Methods
Validate Measures
Conduct Empirical Testing & Evaluation
Implement Program
Revision

Schematic of the Systems Approach to Instruction. The actual system may vary with the program, institution, or individual instructor.

BENEFITS FROM ARTICULATION

Articulation will enable the secondary school graduate to enter a very similar vocational training program at the technical college level and pick up with the next logical step in career development. Articulation will enable the student to continue his training beyond the knowledge and skills level already mastered so there will be a minimum of duplication in time and cost and maximum benefits in terms of knowledge and proficiencies gained from the instructional program.

Articulation should result in a more sequential vocational training opportunity. Training at the secondary and post-secondary levels should become more responsive to the needs of a rapidly changing technological community. Articulation should help improve retention of students who continue their vocational training beyond high school. Moreover, the motivation for learning and performance should be improved among these students.

The articulation process will require teachers and administrators from different schools to work closely together, will encourage cooperation between instructors, and will result in a more uniform curriculum program.

For vocational students, career and educational alternatives will be increased while training time and costs should be decreased. Vocational students should gain mastery of the competencies of their chosen occupational field and will be encouraged to continue their career education as a life-long process. Articulation will facilitate the progression of the student through training and into the work force.

As a by-product of articulation, vocational training should become more relevant to actual job tasks. Graduates should be more productive employees due to their training.

As articulation is thoroughly developed, the taxpayers of Greenville County will gain through the savings of tax dollars that result from more efficient vocational and technical training.

A PROGRESSIVE STEP AHEAD

Typical barriers to articulation such as individual education system divisions, each with its own philosophy, administrative "logistics" or the magnitude of the task of curriculum revision, have not delayed The School District of Greenville County and Greenville Technical College from recognizing the common need to work together at the instructional level as well as at the institutional level. The District and TEC are committed to developing a management system for articulation between similar secondary and post-secondary vocational training programs.

The School District of Greenville County and Greenville Technical College are committed to doing their best to meet the expanding need in Greenville County for workers proficient in vocational skills and knowledge.

PHILOSOPHY OF ARTICULATED, PERFORMANCE-BASED INSTRUCTION GUIDES

The design of the articulated, performance-based instruction guides and the articulation program is based on a philosophy that the vocational education curriculum should be for career training with few fringe or non-related subjects. The student should be given the basis to do useful skilled work upon graduation and employment. The vocational program graduate should have a background which will allow him/her to learn and advance as rapidly as possible on the job, but it should not include subject matter which will not be applicable to his/her work for years. When subject matter is introduced that will not be applicable to the graduate's work for years, it may put the graduate out of perspective. The result might be that the graduate may try to force applications which do not exist, simply because the information is in his/her repertoire. Thus, the purpose of vocational training by the articulated, performance-based instruction guides is to prepare graduates for successful entry into a skilled trade.

To ensure that the design of the articulated, performance-based instruction guides is conforming to the philosophies of both the secondary and post-secondary institutional participants, a periodic review of the guide design and philosophy is recommended.

PURPOSES OF THE ARTICULATED INSTRUCTION GUIDE

The articulated instruction objectives guide arc is expected to serve the following purposes:

1. The guide serves as the primary vehicle for the articulation of subject matter in similar vocational training programs between the vocational education centers, high schools, and Greenville Technical College through use by instructors at both levels as a reference in preparing instruction.

2. The guide provides a listing of the minimum tasks that a student or worker is expected to perform in the conduct of a specific level job in the area of vocational training or work of concern.

3. The guides identify the primary detailed instruction objectives, performance objectives which are based upon the task listings. The tasks are listed in the sequence of complexity, with the least complex task being listed first, except where a task must be performed as a prerequisite to performance of another task.

4. The guides identify the tasks performed (actions, steps, sets of skills) and related technical information which must be taught and learned to accomplish each major instruction objective. The tasks performed represent the minimum skills and related information required for adequate occupational proficiency in the performance objectives.

5. The guides designate the instructional contact hours necessary to provide the required instruction, as required by appropriate educational agencies or offices and as estimated by the instructor-participants on the Vocational Articulation Project Task Forces, and based on the time required to teach the average learner to perform the task. The time estimated is based on having the essential equipment, facilities and instructional aids required to provide the instruction, whenever the class size is limited to an acceptable number.

6. The guides identify the performance standards to be met for occupational proficiency in the task. Performance standards used are those considered to be minimum business or industry standards. The ability to meet the listed standards of performance will be considered as qualification for advanced instruction in the vocational program.

7. The guides provide direction in the conduct of sequential vocational competency instruction by modules or job tasks, resulting in qualification by the learner to perform limited skill specialist jobs of

progressively higher skills until the program objective is reached (i.e., file clerk to executive secretary, etc.). As the student becomes proficient in the performance of tasks in successively more complex modules, more marketable competencies are gained and may be identified as the lower job qualifications of a specialist.

Through this procedure, even the slower student is provided an opportunity to eventually gain sufficient skills to perform adequately as a specialist at some level in the vocational field, even if the student is unable to complete the total program of training.

The standardized sequence of activities of the vocational instruction modules will facilitate lateral articulation between vocational education centers in the School District and will simplify vertical articulation when training is continued at Greenville Technical College articulating to employers.

8. The guides provide a descriptive listing of equipment required to conduct the program of vocational training. The equipment listed is considered to be the type and quantity essential for the conduct of instruction to prepare students for entry-level employment in the vocational field. It may be necessary to delay teaching some tasks involving special equipment, if that equipment is not available at all instructional sites, or to move students and equipment together as necessary to teach skills.

9. The guide provides information about requirements or limitations that typically are involved in the performance of the task, environmental conditions and physical demands, and able to perform the task.

10. The guides provide a list of standardized performance test items/ and outcome-referenced measures to be used in the determination of vocational proficiency. As long as the specifics are not provided, the test items listed cannot be compromised easily and could serve as study guides.

11. The tasks listed in the guide are the minimum requirements for job qualification under average circumstances in a regional market. It is understood that there may be unlisted tasks that some employers may require the worker to do in the occupation, when in their employment. In addition, there may be unlisted tasks, such as mental process tasks, that are not stated but that may occur and that should be considered in instructional planning or testing.

Instructors may teach skills and related technical information other than what is shown in the guides. Provision of additional information should be limited to the students who have completed the requirements for the tasks emphasized in the instructional guides. The change of tasks in the guides should be based on task force committee agreement to ensure lateral and vertical articulation.

12. It is expected that there will be updating and correction of items in the articulated instruction guide. Participants are to be sure that the contents are valid and consistent with business and industry requirements. Recommendations should be submitted to the Vocational Articulation Program office which will assemble and present them to the appropriate committee for review and possible adoption.

13. Typically, the teacher/instructor should not plan to conduct instruction in a given articulated module unless the capability exists to conduct all of the instruction to meet the instructional objectives, with the result that the successful student is qualified to perform the tasks identified within the module.

14. An underlying philosophy in vocational training is that it is better to prepare the student to be fully qualified to perform all of the tasks in a limited group of modules in a vocational field and be qualified at a lower job level rather than to be only familiar with a large number of task descriptions or duties and qualified to perform none of them fully. For higher levels of job qualification beyond the secondary level, the student or worker is encouraged to enroll at Greenville Technical College.

15. Generally, vocational programs will include certain basic modules or courses of instruction without which the student would not be considered vocationally qualified at any level. Basic modules typically will be identified and taught early in the program sequence.

16. The instruction guides provides information essential to help the vocational student who completes training at the secondary level and continues career development training at the post-secondary level in a similar program receive appropriate credit for the articulated vocational training that has been mastered at the secondary level.

DEFINITIONS OF TERMS

The following definitions of terms are applicable to the articulated, performance-based instruction guides developed as products of the Occupational Education Articulation Program.

Behavior:	The actions of a person (specifically, job or job training actions). Behavioral actions include both overt, those that can be observed, and covert, those not observable outwardly. Performance may be interchanged with behavior in the project. (See also Performance Actions).
Concept:	A group of ideas that may be classed together or that are similar.
Criteria:	A standard by which performance may be measured, usually considered the minimum standard.
Domain:	A cluster of related jobs.
Duty:	One of the distinct major activities involved in the work performed and comprising related tasks.
Evaluation:	When comparison is made between a measurement and a standard and judgment is passed on the comparison.
Item:	A single stimulus or stimulus pattern that calls for a single response or set of responses. It is one sample of behavior or performance. The response may be simple or complex.
Job:	The duties or tasks actually performed by a specified individual.
Knowledge:	In this project, knowledge refers to acquired covert behavior which facilitates skills and performance, such as the theoretical information of what should be done under given circumstances, and in what order of sequence performance should occur to accomplish the objective.
Measurement:	The process of determining the extent some characteristic is associated with the student.
Module:	Modules in the pilot Drafting and Business and Office Education curriculum modifications in the Occuptional Education Articulation Program have been designed to

coincide secondary level training with post-secondary level similar areas of training.

Another method of developing modules might be for modules to represent an identifiable, complicated task or job area involving a number of sub-tasks such as "Electrical Systems" in Automotive Mechanics.

Norm-referenced Evaluation: In norm-referenced evaluation, measures are dependent on a relative standard. Measures compare the capabilities of one student to those of other students.

Objective: (See Performance Objective) A stated desired outcome of training or the end result of the job, task, or performance actions. Objectives referred to in this project will be terminal objectives, generally representing a specific job function.

Occupational Education: An organized sequence of learning experiences consisting of vocational theory, practice, and skills taught to students on a regular or systematic basis.*

*Reference: Standards of the Delegate Assembly (Atlanta: Southern Association of Colleges and Schools, Commission on Occupational Education, December, 1972) p. 12.

Outcome-referenced Evaluation: Outcome-referenced, or criterion-referenced, measurement provides a standard of achievement for the individual as compared with specific behavioral objectives and therefore provides information about the degree of competence attained by the student.

The outcome-referenced measure is a performance or other measure based upon a performance objective, the accomplishment of which measures attainment of that objective.

Performance: Performance is used in this project to refer to a job or task which results from a set of sequential actions or steps.

Performance Actions: A series of steps, generally arranged in a sequence ordinarily followed, which when completed may result in the accomplishment of a performance objective (performance of a task).

Performance actions may be referred to as a set or sets of skills, functions, or steps. V-TEC (Vocational-Technical Education Consortium of States) catalogs generally describe performance actions in the "performance guide" of their format.

Articulated, Performance-based Instruction Guide: A comprehensive collection of performance objectives, performance actions to obtain those objectives, suggested hours for instruction (for planning purposes), performance standards, related technical information, and outcome-referenced measures, as well as general secondary level and post-secondary level descriptions of similar courses for the purposes of aiding lateral and vertical articulation concerning the subject area.

Performance-based Instruction: Performance-based (competence-based) instruction is based on the competencies or tasks performed by on-the-job workers. Everything in a performance-based instruction system is made public beforehand. There are no surprises for student, teacher, counselor, or employer. When the student begins a program, information is available to tell the student exactly what competencies are expected to be developed as a result of the instructional program, how and against what standards or criteria the student will be evaluated, and how the student's competencies will be communicated to the student, instructors, and to employers. A performance-based instructional system tells the student exactly what the student must learn, teaches the student that skill or knowledge, and then tests on mastery of that specific competence.

Performance Objective: A statement in precise, measurable terms of a particular behavior to be exhibited by a learner under specified conditions. It possesses each of the elements or characteristics specified below:

Conditions under which the performance is to take place.

Behavior Desired or expected of the student (things to be done, the performance desired).

Standards to determine how well the performance is to be done (criteria).

Performance Test: A performance test requires the student to demonstrate (master) the desired behavior of the objective (accomplish a job-like task) under controlled conditions and according to predetermined standards. The controlled conditions allow the student to demonstrate the desired behavior and the conditions remain consistent from student to student.

Skill: Primarily, skill refers to overt, observable performance, however, it is recognized that there are covert skills required in some performances.

Step: Step is used to refer to a task or action, generally as a sequence of steps involved in the accomplishment of a performance objective or job.

Systems Approach: The systems approach to instruction emphasizes the specification of instructional objectives, precisely controlled learning experiences to achieve the objectives, criteria for performance, and evaluative information.

Task:	A task is a set of skills (set or sets of functions, actions, or steps) the student must perform to accomplish the job (training). A task may be described as a logically related set of actions necessary or required to complete the job objective. Several tasks could be referred to as a duty.
Task Analysis:	Task analysis is breaking down a learning task (objective) into component tasks each of which must be mastered as a prerequisite to mastery of the total job.
Task List:	A listing of tasks (performance objectives) performed by incumbent workers (students in training) within a domain of interest (course of study).
Test:	An event during which the student is asked to demonstrate some aspect of knowledge or skill is a test. It can be a single test item, but usually it consists of several items.

ORGANIZATION

OCCUPATIONAL EDUCATION ARTICULATION PROGRAM
EXECUTIVE COMMITTEE

Because the Occupational Education Articulation Program involved important joint decisions between The School District of Greenville County and Greenville Technical College, such as advanced credit or placement and methods of communications, it was crucial that a governing board be established to provide the necessary structure for coordinating the program through the two institutions. Consequently, an Executive Committee was established during the summer of 1980. The Committee membership represented the chief executive officers as well as executive administrators from the secondary level vocational centers, and representatives from the state-level secondary and post-secondary agencies as well as the federal agency funding the project.

The Executive Committee met at regular intervals to review and discuss the Occupational Education Articulation Program activities and products and to plan the direction of future articulation activities.

OCCUPATIONAL EDUCATION ARTICULATION PROGRAM
ADVISORY COMMITTEE

An Advisory Committee was established so that representatives from the participating institutions and industry might participate in the formulation of the program. The Advisory Committee primarily functioned as a sounding board to determine completion requirements for job-entry skill training and to provide current data about industry manpower needs, new techniques, and equipment trends.

The Advisory Committee, because of its unique membership composition, was asked to make recommendations concerning the credentialing of students at the secondary level, communicating competencies between institutions or to employers, post-secondary handling of graduates of secondary articulated programs that may qualify for advanced placement, and a procedure for meaningful feedback from the post-secondary institution to the secondary institution concerning the competencies of advanced placement students.

The Executive Committee and Advisory Committee membership for the 1981-82 period is listed on the following pages.

EXECUTIVE COMMITTEE

Occupational Education Articulation Program

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244-9585

W. H. Chastain, Director (Committee Chairman)
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288-1842

30

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Dr. Kay Grastie
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Coordinator of Vocational Articulation
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Program Coordinator

Wm. Edward Henderson Jr., Coordinator
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TASK FORCE COMMITTEES

Research and situational analysis clarified that the primary group involved in curriculum development efforts should be the local level teachers.

The vocational and technical education teachers probably are some of the best informed persons to forecast future training requirements and trends in their vocational field at the local level, define objectives which will have to be realized, and outline a syllabus of instruction, determine the order of tasks or topics, suggest an appropriate instructional time, and describe the resources involved to accomplish the overall job.

Program development activities were organized around task force committees composed of teachers and department heads representing the programs of training at the secondary and post-secondary levels.

One objective of the task force committees was to revise curriculum offerings so that the courses would be structured into a sequential, competency-based program. A second purpose was to develop outcome-referenced (criterion-referenced) tests to be administered to students at the completion of their secondary level of training so they would objectively demonstrate levels of achievement. A third purpose of the task force committees was to contribute to the development of a policies and procedures manual to guide continued implementation of vocational articulation and assist with further articulation activities.

The task force committees during the initial year included the following: The Business and Office Education Task Force Committee was to have seventeen vocational teachers from The School District of Greenville County. Each of the fifteen high schools and two vocational centers with Business and Office Education programs were asked to be represented by one Business and Office Education teacher each. The Secretarial Science Department Chairman and five TEC instructors participating represented as time allowed Greenville Technical College.

The Drafting Task Force Committee included four drafting program teachers from the vocational education center of The School District of Greenville County and the Graphics Engineering Technology Department Chairman and other drafting instructors from Greenville Technical College.

The Task Force Committees for Automotive Mechanics, Carpentry (Building Construction), Food Service, and Welding included instructors from the secondary vocational centers and department heads/instructors from Greenville Technical College.

Participation in the task force committees is summarized on the following pages.

TASK FORCE COMMITTEE PARTICIPATION
GENERAL SUMMARY

DRAFTING

4 Vocational Education Centers (Secondary)	Greenville TEC (Post-secondary)
4 Instructors Total	5 Instructors Total
4 Participating	1 Participating (Representative)

BUSINESS AND OFFICE EDUCATION

Secondary		Post-secondary
2 Vocational Centers	15 High Schools	Greenville TEC
2 Instructors Total	47 Instructors Total	9 Instructors Total
2 Participating	14 Participating (13 High Schools Represented)	1 Participating (Representative)

AUTOMOTIVE MECHANICS

4 Vocational Education Centers (Secondary)	Greenville TEC (Post-secondary)
4 Instructors	1 Dept. Head/Instructor

CARPENTRY (BUILDING CONSTRUCTION)

4 Vocational Education Centers (Secondary)	Greenville TEC (Post-secondary)
4 Instructors	1 Dept. Head/Instructor

FOOD SERVICE

3 Vocational Education Centers (Secondary)	Greenville TEC (Post-secondary)
3 Vocational Instructors	2 Dept. Heads/Instructors

WELDING

2 Vocational Education Centers (Secondary)	Greenville TEC (Post-secondary)
2 Instructors	1 Dept. Head/Instructor

DRAFTING TASK FORCE COMMITTEE
SUMMARY OF PARTICIPATION
1981 - 1982

Secondary Drafting Instructor	Secondary Vocational Center	May	June	July	August	September	October	November	December	January	February	Committee Hours
Al Waters	Donaldson	+	+	+	+	-	+	+	-	-	-	36
Richard Davis	Foothills	0	0	0	0	-	+	+	-	-	-	12
Jerry Sparks	Enoree	+	+	0	0	-	+	½	-	-	-	21
Buford Garrett	Golden Strip	+	+	0	0	-	+	+	-	-	-	24

+=Participation
0=No participation
*=Conflict
-=No meeting
½=½day

June, July, and August participation by secondary level instructors was less than planned due to conflicts such as summer employment opportunities, certification training, and family vacation responsibilities.

The post-secondary drafting participant, Walter Rice, Chairman of the Engineering Graphics Department, Greenville Technical College, participated regularly, attending committee meetings as his schedule and responsibilities permitted. When the post-secondary drafting participant was unable to attend a committee meeting, material was shared prior to and after the meeting for information and to gain input. The cooperative interest that Mr. Rice and his instructional staff took in the project made personal visit, telephone, and mail exchanges of information and input feasible.

The summary of participation by secondary level committee members does not reflect mail, telephone, and personal visit exchanges in information and the outside work that is evident in the participants input into the curriculum material.

The estimated total committee hours for the writing of Drafting I by the Task Force Committee, including the TEC representative, but not including the Program Coordinator, is approximately (secondary, 93 hours) and (post-secondary, 6 hours) for a total of 99 hours.

BUSINESS AND OFFICE EDUCATION
TASK FORCE COMMITTEE PARTICIPATION
SUMMARY
1981 - 1982

	May	June	July	August	September	October	November	December	January 1982	February	Total hours Committee	Estimated Outside hours
Donaldson Vocational Center	+	+	+	+	–	+	+	–	–	–	36	12
Enoree Vocational Center		–	–	–	–	–	–	–	–	–	–	
Foothills Vocational Center	*	*	*	0	–	–	+	–	–	–	6	2
Golden Strip Vocational Center		–	–	–	–	–	–	–	–	–	–	
Berea High School	+	0	0	0	–	+	+	–	–	–	18	6
Blue Ridge High School	+	+	+	+	–	+	+	–	–	–	36	12
Carolina High School	+	0	0	0	–	0	+	–	–	–	12	4
Eastside High School	0	+	+	0	–	+	+	–	–	–	24	8
Greenville High School	*	+	+	+	–	+	*	–	–	–	24	8
Greer High School	+	+	+	+	–	+	+	–	–	–	36	12
Hillcrest High School	+	+	+	+	–	+	+	–	–	–	36	12
J. L. Mann High School	*	0	0	0	–	0	0	–	–	–	0	
Mauldin High School	+	0	0	0	–	+	+	–	–	–	18	6
Parker High School	0	0	0	0	–	+	+	–	–	–	12	4
Riverside High School	+	+	+	+	–	+	+	–	–	–	36	12
Southside High School	+	+	+	+	–	+	*	–	–	–	30	10
Travelers Rest High School	+	+	+	+	–	+	+	–	–	–	36	12
Wade Hampton High School	0	0	0	0	–	0	0	–	–	–	0	
Woodmont High School	+	+	+	+	–	+	+	–	–	–	36	12
											396	137
Greenville TEC	+	*	*	*		*	*	–	–	–		
Approximate Participation: %	60	50	50	50		72	72					

CODE:		
	Not applicable	–
	Participated	+
	No Participation	0
	Conflict	*

Secondary participation was by 16 different Business and Office Education teachers representing 13 of the 15 high schools and 2 vocational centers with office education programs. Post-secondary participation was by the Chairman, Secretarial Science Department, Greenville Technical College. Secondary participation in committee meetings/workshops was approximately 396 hours total. Post-secondary participation was approximately 4 hours. Total committee time to produce the Typewriting, Shorthand, Accounting, Office Procedures, and Business English Guides was approximately 400 hours. Outside preparation and work by secondary participants is estimated to have involved at least 137 hours. Outside post-secondary preparation is estimated to be 4 hours. It is possible that more time than is estimated was invested in the development of the instruction guides. The program coordinator's time has not been included in the estimate.

SUMMARY OF PARTICIPATION
1982-1983
TASK FORCE COMMITTEES
OCCUPATIONAL EDUCATION ARTICULATION PROGRAM

Instructor	Voc. Center TEC	April 82	May	June	July	August	September	October	November	December	January 83	February	March	Committee Hr.
AUTOMOTIVE MECHANICS														
Harold Means	Donaldson	x	x	*	x/x	o	x	x	*	o	x	x	x	9
Dennis Mull	Enoree	x	x	*	%	o	x	x	*	x	x	x	x	8
John Romano	Foothills	x	x	*	%	o	xx	x	*	x	x	x	x	8
Douglas Hawkins	Golden Strip	x	x	*	%	o	x	x	*	x	x	x	x	8
Chris Johansan	GTC	x	x	*	–	–	o	+	*	1	1	x	x	3

1. GTC representative currently vacant (Dec. - Feb.)

Instructor	Voc. Center TEC	April 82	May	June	July	August	September	October	November	December	January 83	February	March	Committee Hr.
BUILDING CONSTRUCTION/ CARPENTRY														
J. E. Christie	Donaldson	x	x	*	%	x	x	x	*	*	x	x		7
Ken Bentley	Enoree	x	x	*	%	o	x	x	*	*	x	x		6
T. H. Giles	Foothills	x	x	*	%	x	x	x	*	*	x	x		1
K. F. Kirkland	Golden Strip	x	x	*	%	o	x	x	*	*	x	x		6
Jim Bowen	GTC	–	–	*	–	–	–	–	*	*	1	x		+

1. Sick, out

Instructor	Voc. Center TEC	April 82	May	June	July	August	September	October	November	December	January 83	February	March	Committee Hr.
DRAFTING II														
Al Waters	Donaldson	x	x	*	-/-	*	x	*	*	*	x	x		4
Jerry Sparks	Enoree	x	x	*	-/-	*	x	*	*	*	x	x		4
Richard Davis	Foothills	x	x	*	-/-	*	x	*	*	*	1	x		3
Buford Garrett	Golden Strip	x	x	*	x/-	*	x	*	*	*	x	x		5
Walter Rice	GTC	+	+	*	+	*	+	*	*	*	+	x		+

By coordinator's phone calls and visits.

Instructor	Voc. Center TEC	April 82	May	June	July	August	September	October	November	December	January 83	February	March	Committee Hr.
FOOD SERVICE														
Mary Jane Rowley	Donaldson	x	x	*	x/x	–	x	*	*	x	o	x		7
Odell Evans	Foothills	x	x	*	-/-	–	x	*	*	x	o	x		4
William M. King	Golden Strip	x	x	*	x/x	–	x	*	*	x	x	x		7
Joe Whisonant	GTC	+	+	*	+	+	+	+	*	+	+	x		1+
Roy Springer	GTC	+	+	*	+	+	+	+	*	+	+	x		1+

Instructor	Voc. Center TEC	April 82	May	June	July	August	September	October	November	December	January 83	February	March	Committee Hr.
WELDING														
L. O. Vaughn	Donaldson	x	x	*	-/x	–	x	*	*	*	x	x		5
William W. Schell	Foothills	x	x	*	x/x	–	x	*	*	*	x	x		6
Ralph Knelsleg	GTC	x	x	*	-/-	–	x	*	*	*	x	x		4

CODE:
* = No meeting
o = No participation, % two meetings per month
x = Participation, x/x two meetings per month
½ = ½ day
– = Not applicable, conflict, etc.
+ = By phone call or visit by Articulation Coordinator

1982 - 1983
NARRATIVE SUMMARY OF PARTICIPATION

Task Force Committee meetings scheduled during the summer months of June, July, and early August were not practical due to conflict with secondary instructors attending summer certification courses, holding summer jobs, or on vacation. The summer months, however, provided an appropriate opportunity for research, task analysis, and preparation prior to fall and winter meetings. Because, one or more meetings were held with 1982-1983 participants prior to the 1982 summer months, the technical writer was able to identify enough task objectives to provide a framework for drafting from 25-75 percent of guides during the summer period.

The estimated total committee hours to complete the 1982-1983 articulated, performance-based instruction guides by the secondary and post-secondary participants, but not including the program coordinator, is approximately as follows:

	PARTICIPANTS		
Articulated Vocational Program	Secondary	Post-Secondary	TOTAL HOURS
Automotive Mechanics	220 hr. (37) da.	18 hr. (3) da.	240
Carpentry	156 (26)	Note	156
Drafting II (Architectural, Structural, Mechanical)	16	Note	96
Food Service	108 (18)	12 (4)	120
Welding (Gas, ARC, MIG, TIG)	66 (11)	24 (4)	90

Code: $\frac{\text{Hours}}{\text{(Meeting days)}}$

Note: Participation by phone or visit by Articulation Coordinator

FEBRUARY, 1983
FOLLOW-UP MEETING
BUSINESS AND OFFICE EDUCATION

Fourteen secondary Business and Office Education teacher participants and a GTC program representative met during February, 1983, to review and follow-up the field trial implementation of the Articulated, Performance-based Instruction Guides for Business and Office Education. The main purpose of this meeting was to revise guide drafts based on their field trial findings.

14 Secondary Participants	1 GTC Participant	TOTAL HOURS
84 Hours	2 Hours	86

1981-82 CALENDAR OF COMMITTEE ACTIVITIES

	Executive Committee	Policies & Procedures	Drafting & Design	Business & Office Occupations	Advisory Committee
MAY	Planning Meeting	Initiated Gathering of Data	Task Force Workshop #1 R	Task Force Workshop #1 R	
JUNE			Task Force Committee S Meeting	Task Force Committee S Meeting	
JULY			Task Force Committee S Meeting	Task Force Committee S Meeting	
AUGUST			Task Force Committee S Meeting	Task Force Committee S Meeting	
SEPTEMBER	Progress Report Meeting	Policies & Procedures Outlined			
OCTOBER		Policies & Procedures Outlined	Task Force Workshop #2 R	Task Force Workshop #2 R	
NOVEMBER			Task Force Committee R Meeting	Task Force Committee R Meeting	Advisory Committee Meeting
DECEMBER	Progress Report and Review of Documents and Planning	Draft Completed	---- No Task Force Committee Meetings ----		
JANUARY 1982		Document	Duplication of Guide and Committee Review	Duplication of Guide and Committee Review	
FEBRUARY	Progress Report and Planning	Initial Policies and Procedures	Task Force Committees Received Instruction Guides R	Task Force Committees Received Instruction Guides R	Advisory Committee Meeting

Codes: R = Release Time, S = Stipend Time

1981-82 PRODUCTION SCHEDULE (ACTUAL) (DRAFTING TASK FORCE COMMITTEE)

	Program Description	Task Listing (Objectives) *	Performance Actions +	Performance Standards +	Outcome-Referenced Measurement *
MAY	Workshop #1 Committee began Writing Descriptions	Workshop #1 Began Writing Objectives	Workshop #1 Began Writing Actions	Workshop #1 Began Writing Standards	
JUNE	Committee Reviewed Drafts	Committee outlined Major Objectives (Task Listing)	Task action Writing Continued	Continued Writing	
JULY	Completed	Draft Revisions	Actions completed for each objective	Developed jointly with Performance Actions	
AUGUST		Completed	Revisions	Revisions	
SEPTEMBER	Progress report to Executive Committee	---- No Task Force Committee Meeting During September ----			
OCTOBER		Began review and revisions	Began review and revisions	Began review and revisions	Workshop #2 Began Writing Sample Test Items
NOVEMBER		Completed review	Completed review	Completed review	Completed Writing Test Items
DECEMBER	Reviewed by Executive Committee	---- No Task Force Committee Meeting ---- Reviewed by Executive Committee	Reviewed by Executive Committee	Reviewed by Executive Committee	Reviewed by Executive Committee
JANUARY 1982	Final Revisions and Reproduction	Final Revisions and Reproduction	Final Revisions and Reproduction	Final Revisions and Reproduction	Final Revisions and Reproduction
FEBRUARY	Print & Distribute -----	Print & Distribute -----	Print & Distribute -----	Print & Distribute -----	Print & Distribute -----

* Match the performance and the conditions of the measurement with those of the objective.
+ State a performance standard for each task action.

981-82 PRODUCTION SCHEDULE (ACTUAL)

BUSINESS AND OFFICE EDUCATION TASK FORCE COMMITTEE

	Program Description	Task Listing (Objectives) *	Performance Actions +	Performance Standards +	Outcome-Referenced Measurement *
MAY	Workshop #1 Committee Began Writing Descriptions	Workshop #1 Began Writing Objectives	Workshop #1 Began Writing Actions	Workshop #1 Began Writing Standards	
JUNE	Committee Review	Committee Lists Major Objections	Continued Task Action Writing		
JULY	Completed	Draft Revisions	Tasks described for each performance	Developed jointly with Task Performed	
AUGUST		Completed	Revisions	Revisions	
SEPTEMBER	Progress report to Executive Committee	---- No Task Force Committee Meeting During September ----			
OCTOBER	Began Revisions of Draft	Began Revisions of Draft	Began Review and Revisions	Began Review and Revisions	Workshop #2 Began Writing Sample Test Items
NOVEMBER	Completed Revisions	Completed Revisions	Completed Revisions	Completed Revisions	Completed Writing Sample Test Items
DECEMBER	Reviewed by Executive Committee	---- No Task Force Committee Meeting ---- Reviewed by Executive Committee	Reviewed by Executive Committee	Reviewed by Executive Committee	Reviewed by Executive Committee
JANUARY 1982	Final Revisions and Reproduction	Final Revisions and Reproduction	Final Revisions and Reproduction	Final Revisions and Reproduction	Final Revisions and Reproduction
FEBRUARY	Print & Distribute -----	Print & Distribute -----	Print & Distribute -----	Print & Distribute -----	Print & Distribute -----

30-C

* Match the performance and the conditions of the measurement with those of the objective.
+ State a performance standard for each task action in the breakdown of tasks performed.

1982-1983 CALENDAR OF TASK FORCE COMMITTEE/PROGRAM ACTIVITIES

	AUTOMOTIVE MECHANICS	CARPENTRY	FOOD SERVICE	WELDING	DRAFTING II
April, 1982	Workshop I, Task Analysis, initiated Task Identification	---Same---	---Same---	---Same---	---Same---
May, 1982	Developed Task List and Objectives	Developed Task List	Developed Task List	Developed Task List and Objectives	Developed Task List
June, 1982	No meeting	No meeting	No meeting	No meeting	No meeting
July, 1982	Developed Objectives	No meeting	Developed Objectives	Developed Objectives and Standards and Performance Actions	Developed Objectives: 3 options
August, 1982	No meeting	Developed Objectives	No meeting	No meeting	No meeting
September, 1982	Developed Objectives and Standards	Developed Objectives and Performance Actions	Developed Objectives and Standards	Completed preliminary draft for Early Field Trial	Developed Objectives and Standards
October, 1982	Developed Objectives and Standards	Developed Performance Actions Partial Field Trial	Completed preliminary draft for Early Field Trail	No meeting	No meeting
November, 1982	No meeting	No meeting	No meeting	No meeting	No meeting
December, 1982	Developed Performance Actions. Partial Field Trial of Objectives	No meeting	Reorganized objectives, continued development	No meeting	No meeting
January, 1983	Developed Performance Actions	Developed Objectives, Actions, and Standards	Developed Performance Actions	Completed Committee revisions and tests	Developed Performance Actions
February, 1983	Developed Performance Actions	Identified Tests	Identified Tests	Reviewed and Revised Draft Guide	Developed Tests
March, 1983	Completed Draft Objectives and Identified Tests	No meeting Guide to Word Processing	No meeting Guide to Word Processing	No meeting Guide to Word Processing	No meeting Guide to Word Processing
April, 1983	No meeting Guide to Word Processing	No meeting	No meeting	No meeting	No meeting
May, 1983	No meeting Guide Reproduced	No meeting Guide Reproduced	No meeting Guide Reproduced	No meeting Guide Reproduced	No meeting Guide Reproduced
June, 1983	No meeting Guide Distributed	No meeting Guide Distributed	No meeting Guide Distributed	No meeting Guide Distributed	No meeting Guide Distributed

NO MEETING = Task Force Committee did not meet. Development work continued by Program Coordinator and one or more instructors.

PROGRAM COORDINATOR
OCCUPATIONAL EDUCATION ARTICULATION PROGRAM

The Coordinator, Occupational Education Articulation Program, is responsible for the overall planning and implementation of the articulation efforts between The School District of Greenville County and Greenville Technical College. The Coordinator must work cooperatively with administrators, instructors, and counselors on both the secondary and post-secondary levels as well as with industry and the general public. The Coordinator must provide the leadership in planning, curriculum development, articulation agreements, resource development, and evaluation of articulation.

The Coordinator of the Occupational Education Articulation Program reports administratively to the Consultant for Vocational Education, The School District of Greenville County.

Because the Occupational Education Articulation Program involved important joint decisions between The School District of Greenville County and Greenville Technical College, a governing board, the Executive Committee, was established to provide the necessary structure for coordinating the program through the two participating institutions. The Coordinator meets frequently with the Executive Committee and the individual members of the Committee to plan and implement the articulation program.

The Coordinator's broad duties include, but are not limited to the following:

1. Planning, organizing, actualizing, and controlling the work of curriculum task force committees to accomplish identified objectives.

2. Planning, organizing, and evaluating content and learning processes into sequential activities that facilitate the achievement of objectives.

3. Diagnosing present and projected training needs of business, industry, educational institutions, and the learner.

4. Knowing, comparing, and analyzing different theories of curriculum development, management, and evaluation and adapting them for use in the Occupational Education Articulation Program.

5. Coordinating the modification of existing programs into articulated, performance-based instructional units.

In addition to these broad functions, the Coordinator's duties include:

1. Providing committee administrative support to include an office of record, typing, notification of meetings, preparing and submitting program budgets, preparing necessary budgets and reports to support committee and project activities.
2. Providing or arranging logistical support such as the reproduction of committee-developed products, meeting facilities, materials and supplies, and mailing.
3. Coordinating the adoption of committee developed instruction guides by appropriate staff personnel in The School District of Greenville County and Greenville Technical College.
4. Sending committee products to appropriate persons for comments prior to publication.
5. Coordinating with committee chairmen to arrange committee meetings.
6. Requesting nominations for committee membership or requesting the agreement of persons to serve on committees.
7. Serving as editor of committee products or arranging for such services.
8. Keeping the committee members informed regarding items of committee interest.
9. Surveying program participants or others concerning the articulation project and program products.
10. Other duties that may be necessary to achieve the purposes of the Occupational Education Articulation Program or that may be recommended by the Executive Committee or the participating institutions to facilitate articulation.

Occupational Education Articulation Program

SECRETARY: JOB TASKS

Accurate production typing of manuscript material from rough drafts in pencil or typewritten form. Emphasis on accurate proofreading for typographical errors and neat correction of typing errors. Ability to proofread for spelling errors, spell correctly, use thesaurus to check meanings of words or add variety to written material by using synonyms, and use of word-division guide. Ability to proofread for punctuation errors, refer to punctuation guide as necessary, and correct punctuation errors in material typed. Typing and finishing tables, charts, and schematics from rough draft material. Ability to center and perform tabulations.

Willingness to draft type and finish material until it is in a form acceptable to the project coordinator, appropriate task force committee, or an editor (100% accuracy and in acceptable format). Ability to interpret proofreader marks and make appropriate corrections to typed material.

Above average typing skills. Ability to organize work station and work activities. Given several job tasks, ability to set priorities to accomplish tasks on schedule.

In addition, duties include; filing records and material for easy retrieval, ordering materials, processing requisitions, and preparing routine correspondences. Uses District copy machines to reproduce documents and other information. Services by District Word Processing are coordinated by the Secretary. Mechanical preparation and distribution of project documents. Other secretarial duties that may be required by the Program Coordinator.

Reports to the Coordinator, Occupational Education Articulation Program.

Wm. Edward Henderson Jr., Coordinator
Occupational Education Articulation Program
April 18, 1983

WEH

THE ARTICULATION PROCESS

THE ARTICULATION PROCESS

The purpose of the Occupational Education Articulation Program is to develop continuous lines of vocational training in selected similar vocational training programs so that students may continue their education at the secondary and post-secondary levels without loss of time or waste of effort in repeating tasks that have been mastered previously.

The Program provides a system where teachers can cooperate effectively in providing a continuous occupational development program where the level and type of training that leads to entry-level employment skills will be clear to students, teachers, other educators, and employers.

The Occupational Education Articulation Program is based on the concept that similar vocational training programs which start from the beginning of the total occupational program often result in a duplication of instruction. To address this fact, articulation, through the vehicle of performance-based instruction, is designed to reduce the need for post-secondary level students to repeat vocational training successfully mastered at the secondary level, if similar training at the the post-secondary level is continued within a specified time.

The articulation of vocational training between the secondary and post-secondary levels is based on several concepts that have proven valid in other articulation projects, such as the joint project by the North Carolina Department of Instruction and the North Carolina Department of Community Colleges. Basic to the Program concepts are the following:

1. Similar vocational training courses at the secondary and post-secondary levels must be standardized in content so as to be identifiable.

2. In addition to standardized performance objectives, both levels of training must require similar standards of job performance in tasks.

3. Finally, to foster validity and reliability in the articulation process, it is necessary to standardize test items and procedures in evaluating student job performance.

The standardization of performance objectives (course content) is based on the actual tasks necessary for success in employment in the local or regional labor market. The performance standards are determined by the level of performance emphasized by employers for initial job entry level qualification. Performance standards exceeding the minimum recommendations for articulation are encouraged, especially for better students. Outcome-referenced measures and evaluation of performance reflect agreement at both levels of vocational training.

Because the Program involves important joint decisions between The School District of Greenville County and Greenville Technical College concerning advanced credit or placement and methods of communications, a governing board, the Executive Committee, was established to provide the necessary structure for coordinating the Program through the two institutions. The Executive Committee consists of the executive administrative officers of the two institutions as well as executive staff administrators responsible for curriculum, vocational education center unit administrators, and others.

In addition, an Advisory Committee was established so that representatives from the participating institutions and industry might participate in the formulation of the Program. The Advisory Committee primarily functions as a sounding board to determine completion requirements for job entry skill training and to provide current data about industry manpower needs, new techniques, and equipment trends.

Because of its unique membership, the Advisory Committee was asked to make suggestions concerning: (1) how the credentialing of student competencies at the secondary level could be communicated between the secondary and post-secondary levels, (2) procedures for counseling secondary students who may want to continue their education in an articulated secondary or post-secondary program, (3) the procedures for handling students who wish to pursue advanced placement, and (4) how the articulation program may be communicated to appropriate secondary level guidance personnel so they may counsel students at the high schools and vocational centers.

The Drafting Task Force Committee and the Business and Office Education Task Force Committee formed the important writing teams of the Program. These committees met regularly during initial project year to draft the instruction guides and for input into the Policies and Procedures Guide for Articulation.

During the initial year of the Program, teacher representatives from fourteen high schools and two vocational education centers of the secondary level program, The School District of Greenville County, and instructor representatives from participating departments of the post-secondary level program, Greenville Technical College, were brought together in task force committee and workshops to survey very similar Business and Office Education and Drafting courses of training to identify possible overlap or gaps as students continued their secretarial science or drafting training from the secondary level to the post-secondary level. In addition, there was interest in lateral articulation of similar programs at the secondary level. Articulated, performance-based (competency-based), instruction objectives guides were developed by task force committees to facilitate articulation. The task force committees, by the task analysis process, identified the essential competencies for Drafting, Typewriting, Shorthand, Accounting, Office Procedures, and Business English for a student to continue training in a similar vocational area or for initial entry into the labor market in the field of training or a related field. Major objectives were identified and placed in sequential order, instruction time was estimated, and performance standards were stated. Finally, outcome-referenced (criterion-referenced) measures of competency were developed as a guide in articulating.

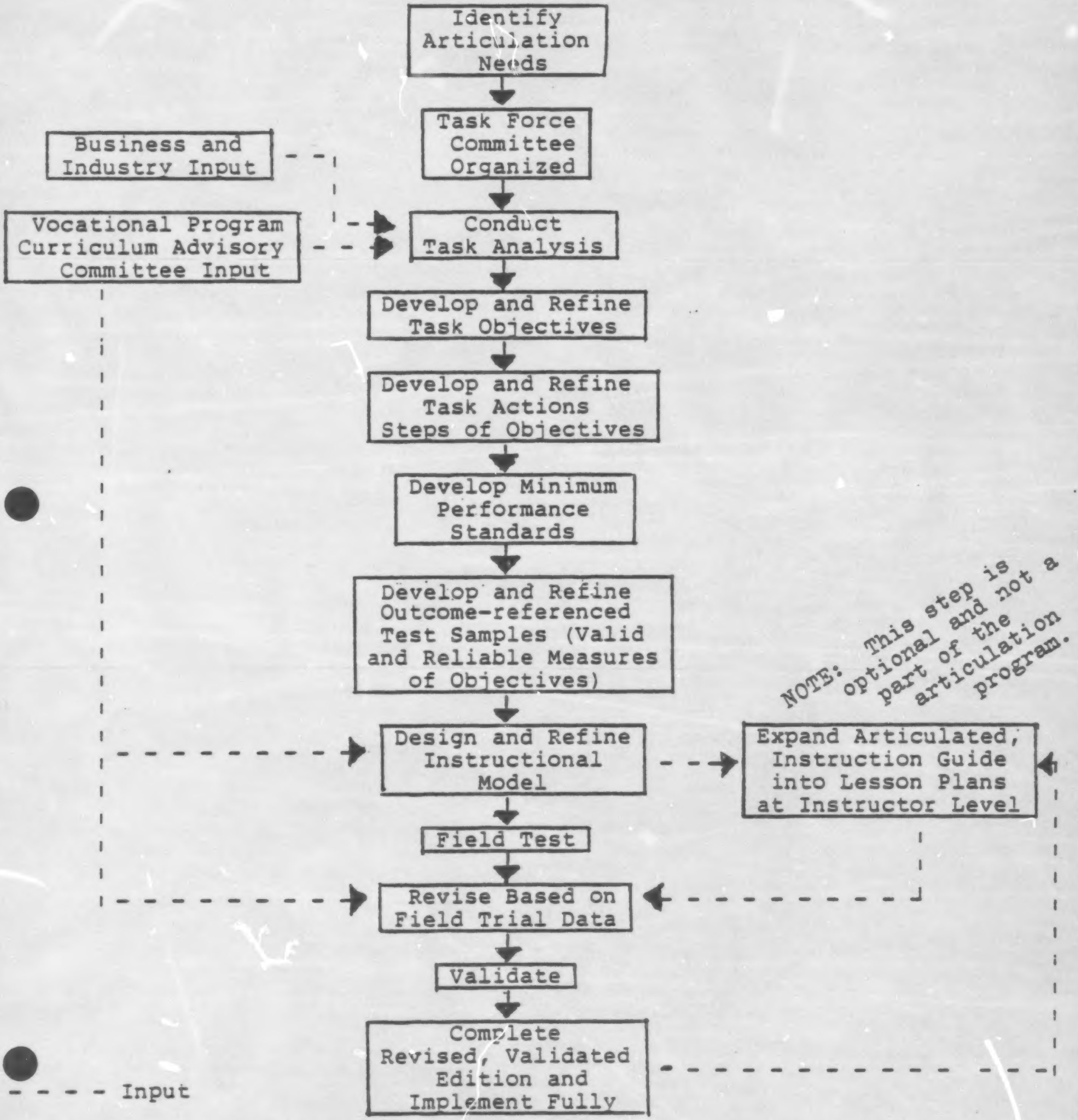
Traditionally, educators have tended to generate instructional objectives from content, working forward to an output. Trainers in industry, the military, and more recently, in the vocational education field, have stressed instructional objectives for a specific job, working from performance to curriculum development. The latter approach is promoted in the Articulation Program to ensure the validity of curriculum objectives and content in performance-based vocational training.

The Articulation Program emphasizes (a) the conditions under which performance is to take place, (b) the behavior desired or expected, and (c) standards to determine how well the performance is to be done as three essentials of an objective. Matching the performance and conditions of sample test with objectives is promoted in product development.

The Program emphasizes the systems approach to instruction because it provides for feedback, emphasizes the total system over any single component, provides a frame of reference for planning and remaining on target, and becomes an organized part of a larger set of interacting systems. The systems approach of occupational training starts with a definition of the purposes of the training. This definition (objectives statement) remains the criteria for evaluation throughout the course, and achievement against the stated goals is the measure of success.

It was not feasible, within the time limitations, to implement in the development of instructional guides a validated sequential development of learning actions. A review of works by Gagne' and Bloom; Teaching Machines and Programmed Learning, II, by Robert Glaser, ed.; and current literature concerning the affective domain should provide ideas for future improvements of the instructional guides.

SCHEMATIC OF
ARTICULATED, PERFORMANCE-BASED INSTRUCTION GUIDE
DEVELOPMENT PROCESS


Identify Articulation Needs
Task Force Committee Organized
Business and Industry Input
Vocational Program Curriculum Advisory Committee Input
Conduct Task Analysis
Develop and Refine Task Objectives
Develop and Refine Task Actions Steps of Objectives
Develop Minimum Performance Standards
Develop and Refine Outcome-referenced Test Samples (Valid and Reliable Measures of Objectives)
NOTE: This step is optional and not a part of the articulation program.
Design and Refine Instructional Model
Expand Articulated, Instruction Guide into Lesson Plans at Instructor Level
Field Test
Revise Based on Field Trial Data
Validate
Complete Revised, Validated Edition and Implement Fully

- - - - Input

Schematic design by Ed Henderson Jr., 1982.

IMPLEMENTATION PROCESS
TO ARTICULATE
"ONE" VOCATIONAL PROGRAM

1st YEAR	2nd YEAR	3rd YEAR	4th YEAR
Development	Field Trial Implementation	Full Implementation of Revised Guides	Continuation of Articulation
Task force committee organized. Task force committee meets regulary to draft articulation document. Articulated, performance-based instruction guide (description, objectives, standards, performance actions, and outcome-referenced tests) developed. NOTE: Depending on the vocational program and the CBVE curriculum development skills of the task force committee participants, it may be possible to complete an articulation guide to a stage which will allow "early" implementation during the first (development) year or it may require a two year period for guide development.	Using the articulated, performance-based instruction guide developed during the first year: implement (a) CBVE or lateral articulation at the secondary level and (b) vertical articulation. Field trial articulated instruction guide. Revise guide based upon field trial experiences. Initiate the collection of data for future validity and reliability study. Articulation guide should be reviewed by each (school level) vocational program "curriculum advisory committee". Curriculum research and document shared with curriculum research/resource centers (ERIC, etc.).	Continued implementation of articulated CBVE guide, preferably a revised edition. Second year that one "graduation class" of students has been educated by articulated CBVE guide (Class has had two full years (complete program) of articulated CBVE instruction.). Data collected from any "advanced placement" students at Greenville Technical College for validity and reliability study. Data collected from secondary program graduates currently employed in the "vocational field," which has been articulated.	Continue articulation process, revising guide to ensure validity of objectives, tests, etc., and to ensure that there is no unnecessary gap or overlap in secondary to post-secondary vocational education and that graduates are competent to successfully enter the job market in skilled employment. First opportunity to conduct validity/reliability study of graduates with two years of secondary education by articulated CBVE guide. First year of fully revised guide.
Guide developed	First year that guide is implemented at secondary level	First year that a secondary program graduate exposed to one year of articulated, CBVE enters post-secondary education or employment.	First year that a secondary graduate exposed to two years of articulated CBVE enters post-secondary training or employment.
1st YEAR	2nd YEAR	3rd YEAR	4th YEAR

SIMPLIFIED STEPS
OF THE DEVELOPMENT OF
ARTICULATED, PERFORMANCE-BASED INSTRUCTION GUIDES

DOCUMENT PRE-DEVELOPMENT ACTIVITIES

(WS) WORKSHOP TO ENSURE ALL TASK FORCE COMMITTEE PARTICIPANTS ENTER THE DEVELOPMENT PROCESS WITH A COMMON UNDERSTANDING OF THE PROGRAM, TASKS EXPECTED OF THEM, AND A COMMON LANGUAGE

↓

SURVEY SIMILARITIES OF SECONDARY AND POST-SECONDARY PROGRAMS

↓

DESCRIBE SECONDARY AND POST-SECONDARY SIMILAR PROGRAMS OF TRAINING: CURRICULUM AREAS TO BE DEVELOPED INTO COMPETENCY-BASED DESCRIPTION

↓

IDENTIFY STATE AND LOCAL EDUCATIONAL STANDARDS

↓

(WS) WORKSHOP PRECEEDS TASK ANALYSIS TO IDENTIFY PERFORMANCE EXPECTATIONS OF POTENTIAL EMPLOYERS

↓

INPUT FROM CURRICULUM ADVISORY COMMITTEES THROUGH INSTRUCTOR/INSTITUTIONAL PARTICIPANTS (SURVEYS AS NECESSARY)

↓

DOCUMENT DEVELOPMENT PROCESS

(WS) WORKSHOP ON WRITING OBJECTIVES, ACTIONS, AND STANDARDS

↓

DEVELOP VALID TASK LIST OF PERFORMANCE OBJECTIVES

↓

ARRANGE PERFORMANCE OBJECTIVES IN LEARNING SEQUENCE

↓

SEQUENCIAL LISTING OF PERFORMANCE ACTIONS TO REACH OBJECTIVES

↓

IDENTIFY PERFORMANCE STANDARDS FOR TASK COMPETENCY

↓

IDENTIFY "SUGGESTED INSTRUCTIONAL TIMES" FOR PLANNING PURPOSES

↓

IDENTIFY RELATED TECHNICAL INFORMATION FOR EACH OBJECTIVE

↓

REVIEW OF OBJECTIVES, ACTIONS, AND STANDARDS BY CURRICULUM ADVISORY COMMITTEES THROUGH TASK FORCE COMMITTEE PARTICIPANTS

↓

(WS) WORKSHOP PRECEEDS DEVELOPMENT OF OUTCOME-REFERENCED TEST SAMPLES

↓

REVIEW TEST ITEMS AGAINST OBJECTIVES TO ENSURE THERE IS AGREEMENT IN CONDITION, PERFORMANCE, AND STANDARDS

↓

SUMMARIZED INSTRUCTIONAL TIME ESTIMATES AND ADJUST TO EQUAL PROGRAM REQUIREMENTS

↓

LIST MINIMUM TRAINING EQUIPMENT

↓

DEVELOP STATE-OF-THE-ART BIBLIOGRAPHY

↓

IDENTIFY AND DEVELOP APPENDIXES

↓

POST-DEVELOPMENT PROCESS

MUTUAL AGREEMENT (SIGNED BY INSTRUCTOR PARTICIPANTS) CONCERNING ARTICULATION DOCUMENTS

↓

(WS) ORIENTATION WORKSHOP TO EXIT DEVELOPMENT PROCESS: SUMMARIZE ARTICULATION PROGRAM AND COMPETENCY-BASED INSTRUCTION TO ALL TEACHER PARTICIPANTS

↓

FIELD TRIAL IMPLEMENTATION, VALIDATION STUDY

↓

CORRECTIONS, REVISIONS, AND MODIFICATIONS BASED ON FIELD TRIAL FINDINGS

↓

FULL IMPLEMENTATION OF GUIDES

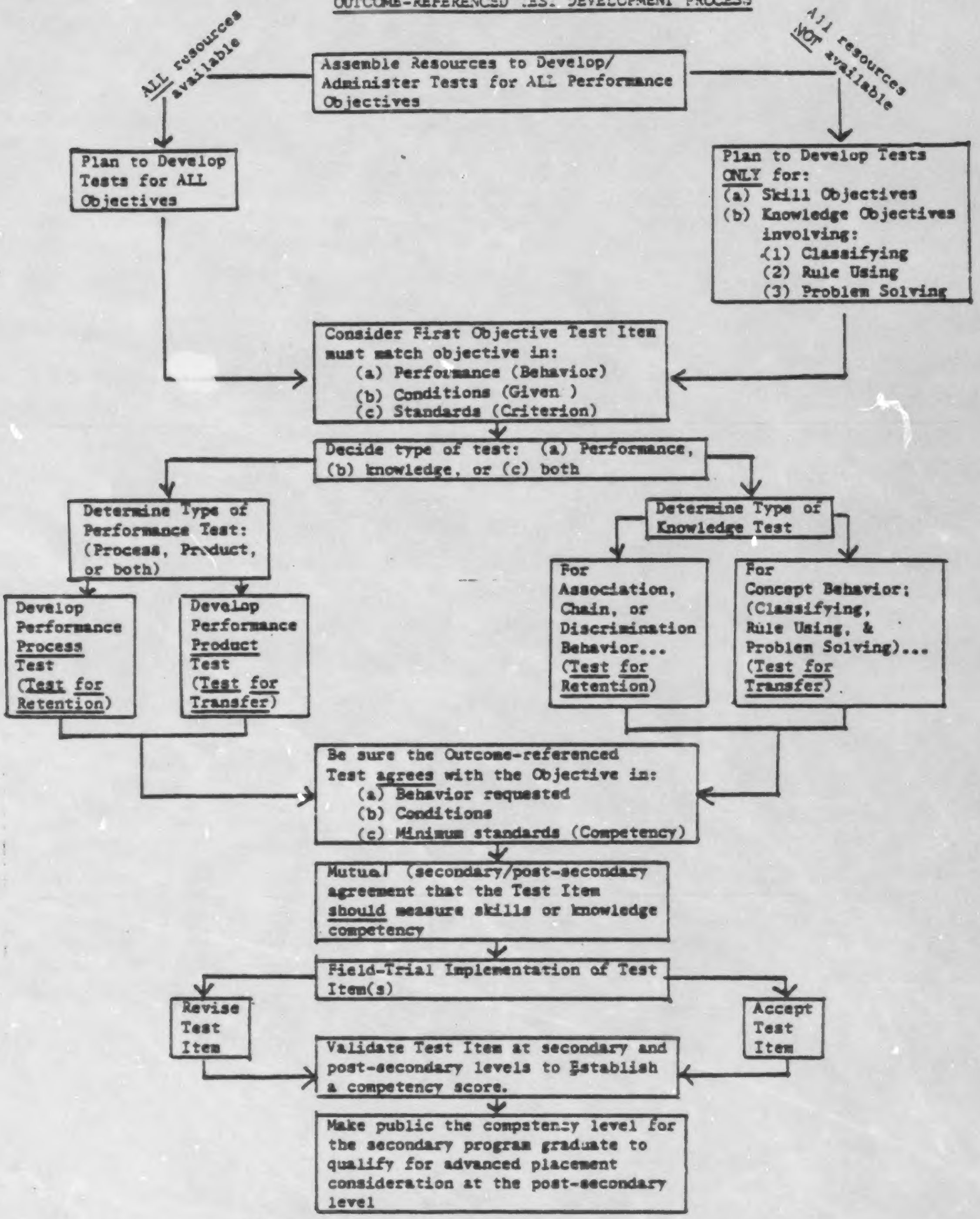
↓

PERIODIC REVIEW, TASK SURVEY WITH INDUSTRY, ETC., TO ENSURE VALIDITY OF ARTICULATED, PERFORMANCE-BASED INSTRUCTION GUIDES

(WS) = Workshop

Process design
by Wm. Edward Henderson Jr.
Revised May, 1983

RECOMMENDED SEQUENCE
OUTCOME-REFERENCED TEST DEVELOPMENT PROCESS


Assemble Resources to Develop/ Administer Tests for ALL Performance Objectives
ALL resources available
All resources NOT available
Plan to Develop Tests for ALL Objectives
Plan to Develop Tests ONLY for: (a) Skill Objectives (b) Knowledge Objectives involving: (1) Classifying (2) Rule Using (3) Problem Solving
Consider First Objective Test Item must match objective in: (a) Performance (Behavior) (b) Conditions (Given) (c) Standards (Criterion)
Decide type of test: (a) Performance, (b) knowledge, or (c) both
Determine Type of Performance Test: (Process, Product, or both)
Develop Performance Process Test (Test for Retention)
Develop Performance Product Test (Test for Transfer)
Determine Type of Knowledge Test
For Association, Chain, or Discrimination Behavior... (Test for Retention)
For Concept Behavior; (Classifying, Rule Using, & Problem Solving)... (Test for Transfer)
Be sure the Outcome-referenced Test agrees with the Objective in: (a) Behavior requested (b) Conditions (c) Minimum standards (Competency)
Mutual (secondary/post-secondary agreement that the Test Item should measure skills or knowledge competency
Field-Trial Implementation of Test Item(s)
Revise Test Item
Accept Test Item
Validate Test Item at secondary and post-secondary levels to Establish a competency score.
Make public the competency level for the secondary program graduate to qualify for advanced placement consideration at the post-secondary level

"Schematic" of outcome-referenced test development process of Occupational Education Articulation Program* developed by Wm. Edward Henderson Jr. 1982.
*Articulation is accomplished using a limited competency-based vocational education (CBVE) curriculum description.

IMPLEMENTATION

IMPLEMENTATION OF ARTICULATION

JOINT STATEMENTS OF AGREEMENT FOR ARTICULATION

Prior to initiating an articulation program, there should be a joint statement of agreement concerning the articulation program by the administrative heads of the secondary and post-secondary institutions.

If it is considered appropriate by the institutions, the respective boards or trustees might be asked to concur with the formal agreement or issue the statement of support. The boards or trustees of the participating institutions should be aware of and support the articulation process.

The formal agreement to enter into articulation should be communicated to administrators and participants who will be involved in the articulation process.

SCOPE OF ARTICULATION PROJECT

There should be a clear understanding between the administrative heads of the participating institutions and the articulation program staff concerning the direction and scope of the program. Articulation products may range from a comprehensive statement of objectives, performance actions to reach the objectives, standards of performance, outcome-referenced measures, and other information to a summary checklist of objectives or objectives topics. Agreement on the quality of the articulation products desired is important as resources for product development and implementation are allocated.

JOINT ACTIONS TO SUPPORT ARTICULATION

Any articulation policies and procedure requiring joint action should be implemented by joint agreement.

There should be no unilateral actions that may inhibit articulation efforts. Secondary and post-secondary participants in the articulation process should be considered as equals in articulation activities.

POLICIES AND PROCEDURES GUIDE DEVELOPMENT

The Policies and Procedures Guide has been developed based on the experiences and recommendations of other programs of articulation; on the recommendations of the Task Force Committees, Advisory Committee, and Executive Committee; as well as the recommendations of educators from the participating institutions; and based on experiences of this articulation program.

Every effect was made to learn the problems and successes of other articulation project so that maximum quality in articulation materials could be developed within available time and resources and so that the most effective articulation process would result from program activities. The Occupational Education Articulation Program represents the specific interests of the participating institutions and is not a duplicate of similar articulation programs.

Every effort has been made to base this articulation program on a workable, theoritical base. Concepts have been documented to provide participants or others with a direction for future articulation activities and with sources of additional information.

Articulation activities in the first year of the project occurred in two distinct phases. Phase I began with an introduction to the articulation program; the purposes of the articulated, performance-based instruction guides that would be developed; and a proposed product development schedule. Phase I consisted of a workshop and working sessions concerning writing program descriptions, curriculum objectives, performance actions to reach objectives, and standards of performance. Phase II of the program began several months later with a workshop and working sessions concerning writing outcome-referenced measures on the objectives already developed.

A comprehensive five-page "Fact Sheet" concerning the Occupational Education Articulation Program was designed to brief participants and others concerning the scope and purposes of the project. In addition, a handout, "Purposes of the Instruction Guides", was used to clarify to participants and others why the articulated, performance-based instruction guides were being developed and how they might be used. Other literature was used to fully brief the participants and ensure that they became a knowledgeable contributor to and supporter of the program as quickly as possible. The program information material helped to ensure that participants entered the articulation process with a common understanding of the terminology, concepts, and objectives of the articulation program and the tasks necessary of participants.

DEVELOPMENT OF WORKSHOP GUIDES

As the two workshop sessions were planned, distinct sub-products of the program emerged. A workshop guide concerning how to write objectives, actions to reach the objectives, and standards was developed. The second workshop guide was designed to aid the writing of outcome-referenced measures. Both guides were reproduced and made available to the participating institutions for future articulation activities or for use in the development of performance-based instruction guides at the school or department level. Each workshop guides contain a sample agenda and timetable, a how-to-do-it section that can be reproduced and distributed to participants in the workshops, an extensive bibliography, and an additional section to aid the workshop leader/coordinator.

The workshop guides are designed to be a resource for the school principal or department head who might wish to develop articulation or performance-based instruction materials with the minimum of preparation.

INITIALLY PROJECT ACTIVITIES PHASED DEVELOPED

Because it was necessary to compact activities into a time frame less than typically has been taken to develop similar curriculum documents, a "phased development" of project activities was employed. The concept, borrowed from the construction industry, simply involved the beginning of a second or follow-up step prior to the completion of a previous activity. The process was manageable and was effective in developing the products quickly. The "phased development" approach to producing articulated, performance-based curriculum materials is not recommended, however. If the project time is not sufficient for the development of performance-based curriculum materials, there is the possibility that product quality may be sacrificed. The phasing of activities in this Program was based on a field judgment and was for the purpose of accomplishing the program objectives in a compacted time period.

USE OF OTHER ARTICULATION PROGRAM MATERIALS

It was helpful to refer to the excellent materials borrowed from the Articulation of Vocational/Occupational Education Programs between the North Carolina Public Schools and Community Colleges/Technical Institutes. The Policies and Procedures Guide of the North Carolina project, was an excellent resource for ideas. In addition, several business education articulation guides were received from the Trident Area Project based in Charleston, SC. Other materials were obtained through the South Carolina State Board for Technical and Comprehensive Education and from articulation programs in other states.

At the initiation of articulation programs, is recommended that an ERIC (Educational Resources Information Center) Search of relevant data be made. An ERIC Search was not conducted during the initial first year phase of this project, but a search during the development of additional programs provided much helpful information.

USE OF V-TEC CATALOGS

It was the aim of the Occupational Education Articulation Program to build on existing competency-based (performance-based)'material already developed in the areas of training being articulated. Since the time frame of the project was compressed, it was important to consult available sources so the Task Force Committees would not duplicate the work of others. Several V-TEC (Vocational-Technical Education Consortium of States) catalogs related to the areas of training being articulated were consulted as performance-based instruction guides were developed.

The purpose of V-TEC catalogs is to develop, on a shared basis, through a catalog of performance objectives, explicit statements of what a student should know or do to perform given vocational competencies.

The V-TEC catalogs did not prove to be a total resource for objectives and, in some cases, it was found that local vocational teachers, based on their contact with industry, preferred to write articulated objectives based on local entry level skill needs.

As new programs are articulated, V-TEC catalogs should be consulted for ideas and directions.

COMPETENCY-BASED VOCATIONAL EDUCATION INFORMATION EXCHANGE

A highly recommended resource for competency-based materials is the Competency-based Vocational Education Information Exchange through the publication "OPEN ENTRIES" which is available from The Center for Studies in Vocational Education, Florida State University, currently at $5.00 for quarterly issues for one year.

Enclosed are "Performance Checklist" for contributing to the publication, "OPEN ENTRIES," a sample announcement page, and a "Materials Wanted" page.

(Enclosures at end of this section.)

UTILIZATION OF ARTICULATED INSTRUCTION GUIDES

The end value of the articulated instruction objectives guides depends on the implementation of their use in guiding performance-based instruction in the classroom. The guides are not designed to supplement current instruction, but are a method of modifying the existing curriculum so that there are standardized objectives, actions to reach objectives, performance standards, and outcome-referenced measures.

The articulated, performance-based instruction guides are not designed to be a day-to-day lesson plan and they are not meant to direct individual teaching styles or strategies. The daily instruction of students or the pace of the individual classroom training is not addressed in the articulated guides.

The guides simply are an agreed upon set of objectives, conditions, standards, general steps to reach objectives, and sample test items that may be used in measuring competency of student performance.

In no way is there limiting of the curriculum. The instruction guides represent the minimum competencies that the average student should master in an average training situation for successful entry level employment or program continuation. It is anticipated that individual instructors typically will exceed the minimum competency recommendations in the articulated instruction guides.

The articulated instruction guides have not been designed to assist the teacher in grading students. The guides, however, do contain checklists, performance standards, and a proficiency report (competency report) to aid the lateral or vertical articulation process. Grading remains the responsibility of the individual instructor according to institutional policies and procedures.

REVISION OF ARTICULATED INSTRUCTION GUIDES

The articulated, performance-based instruction guides have been produced by task force committees representing their fields of speciality in vocational training at the secondary and post-secondary levels.

The initial use of the guides will be in field testing to identify those areas that may have to be modified so the guides will be valid. The field trial year will allow for further input from teachers using the guides, as well as for review by task force committee participants.

It is anticipated that the guides will require revision after the first full year or field trial. It is recommended that the guides be reviewed and revised at no less than every two years.

During the initial trial year, there should be regular contact between the articulation program coordinator and task force committee participants to share field trial findings. It is recommended, however, that task force committee participants forward revisions and suggestions to the articulation program coordinator rather than holding them until a regular meeting.

USE OF EXISTING LOCAL ADVISORY COMMITTEES

Existing curriculum advisory committees in areas being articulated should be involved in the articulation process since these committees, representing business and industry, generally have goals similar to those of the articulation program. Existing advisory committees might be asked to provide input into and review the objectives, performance actions, and task standards developed with regard to current and future industry needs. By using existing secondary and post-secondary curriculum advisory committees, the articulation program would not have to duplicate existing committees.

PUBLICITY OF PROGRAM

Because the development of the program products was compacted into a tight time frame, it was decided that the publicity of the program should be accomplished by the communication resources of participating institutions. Both The School District of Greenville County and Greenville Technical College had print as well as electronic media activities to contact publics. In addition, the student school publications of the fifteen high schools, the vocational centers, and Greenville TEC were asked to help publicize the program.

It is recommended that all existing public information resources within the participating educational organizations be utilized to publicize the program. The articulation program, however, should not rely entirely on existing offices to provide the public information necessary for the success of the program.

A Performance Checklist for Your Contributions to OPEN ENTRIES

Given the proper form, such as the following, the Subscriber/Contributor will send, on a frequent basis, written contributions in one or more of the categories listed below.

Materials Offered

☐ 1. Described competency-based vocational education (CBVE) materials available:

Occupation/Program/Title ____________ Reading level ____________

If student materials, offer includes:

task list? ______ enabling objectives? ______

performance objectives? ______ learning activities? ______

learning resources? ______

print ____________

audiovisual ____________

computer-based ____________

tests? ______ form & type of tests ____________

If teacher/system manager materials, offer includes: ____________

____

Material offered requires special use or reference to other materials?

______ If yes, explain ____________

Appropriate for Special Needs? ______ Copyright status ____________

Cost/sharing arrangement ____________

Materials Wanted

☐ 2. Described needed CBVE materials or resources:

Occupation/Program/Title ____________

Type of material (task list, learning modules, system management materials, etc.)

____

____

____

Contributor/Contact Person:

Name, Position ____________

Institution ____________

Street address ____________ City ____________

State ____________ ZIP ____________ Phone ____________

Send your filled-in form to Editor, *OPEN ENTRIES*, The Center for Studies in Vocational Education, Florida State University, Stone Building, Tallahassee, FL 32306.

We recommend you duplicate this form, so you can keep a supply on hand for future use.

Methods/Strategies for Implementing/Managing CBVE

A third category of contributions to *OPEN ENTRIES* includes brief reports of successful innovations in CBVE system management, curriculum development, program development, program evaluation, and inservice strategies.

Your reports need not be in formal manuscript form. An outline of the information and notes are entirely acceptable. If resource persons are available for consultation or conference presentations, let us know. Photographs of CBVE in *action* are also acceptable.

Send your reports to the Editor, at the address given above.

OPEN ENTRIES

A Competency-Based Vocational Education Information Exchange

A PILOT FOR MASSACHUSETTS

PERSONALIZED COMPETENCY-BASED vocational education (CBVE) is an effective, widely accepted way to prepare individuals for meaningful employment, through joint planning by educators and the work community of a curriculum that reflects actual employment needs. This conclusion has prompted the Massachusetts Division of Occupational Education to sponsor a pilot project establishing seven demonstration sites for CBVE implementation in four program areas.

The sites include the state's six regional vocational schools and the Humphrey Occupational Resource Center in the Boston school system. The Humphrey Center, already active in CBVE implementation and located in the area of greatest employment demand in the hotel and lodging field, is handling curriculum revision for training in Hotel/Lodging Occupations. Teaming up for the area of Food Management, Production, and Services are the Greater Lowell and Tri-County Regional Vocational Schools. The Greater Lawrence and Franklin County regional schools are working on Machining Trades, and the Assavet Valley and Minuteman schools on Electronics Technology.

Assavet Valley is taking the additional leadership responsibility of developing the inservice manuals for the four areas. Educators from other schools, employers, labor union representatives, and other experts are participating through newly formed statewide advisory committees for each program. Validation of job competencies is expected to be completed this fall, and field tests are slated for this winter.

To find out more about the project, write or call *Elaine Cadigan, OE, Equity Coordinator, Division of Occupational Education, Massachusetts Department of Education, 1385 Hancock St., Quincy, MA 02189; (617) 770-7356.*

CBVE BONUS: ARTICULATION

SOUTH CAROLINA EDUCATORS in the Greenville County School District and at Greenville Technical College have joined forces to articulate their secondary and postsecondary training programs through the implementation of competency-based vocational education (CBVE).

Now in its second year, their special project federally funded through the Appalachian Regional Council has resulted in articulated, competency-based curriculum guides for six secondary programs: Accounting I and II, Business English, Drafting I, Office Procedures, Shorthand I and II, and Typing I and II. Three reference tools have also been developed, two workshop guides for teachers and a policies-and-procedures manual for administrators.

The focus for this year's efforts is development of five more curriculum guides, for Automotive Mechanics, Carpentry, Commercial Cooking, Drafting II, and Welding. Almost all of these are expected to be ready for distribution next February.

Participants in the development process have taken in stride the hard work and tight schedules because of their enthusiasm for the project goals—reducing duplication in similar vocational programs and developing a continuous sequence of job-skill training. Techniques for easing the process have included holding how-to-do-it workshops before the instructor task force committees begin their work sessions.

The two workshop guides provide handouts on writing objectives, standards, tests, and other components of the final products. The task of writing objectives was made simpler by using prepared forms with fill-in spaces for task identification, objective statements, listing of performance actions, and related information. Validated task lists have been used where practical.

Reference copies of the completed curriculum guides are available from six resource centers: ERIC Clearinghouse for Adult, Career, and Vocational Education, Ohio State University; Southeast Network for Curriculum Coordination, Mississippi State University; and in South Carolina the Council on Vocational-Technical Education, the State Office of Vocational Education, and the Educational Services Division of the State Board of Technical Education.

For more information on project activities, write or call *Ed Henderson, OE, Coordinator, Occupational Education Articulation Program, Greenville County Schools, Box 2848, Greenville, SC 29602; (803) 242-6450.*

WE JUST CAN'T RESIST . . .

. . . letting you know that *OPEN ENTRIES*, a periodical made possible by your support, has won a top national award for excellence in educational journalism.

The Educational Press Association of America (EDPRESS), in its 1982 national competitions, not only honored *OPEN ENTRIES* for Distinguished Achievement in the subcategory of "newsletters with national circulation" but also named it as, in fact, the Most Outstanding Entry in all "newsletter" categories for this year.

EDPRESS represents over 600 publications. Such recognition of the service provided by the *OPEN ENTRIES* information exchange could not have happened without your support—through your subscription and through your contribution of items to each issue of the quarterly. If you'd like to contribute to a future issue, just write to the editor at the return address given on page 6.

Vol. 2 | No. 1 | Sept. | 1982

MARK YOUR CALENDAR

ON DECEMBER 1 AND 2 in St. Louis, Missouri, just prior to the American Vocational Association's annual convention, a workshop will be held on Implementing Competency-Based Administrator Education Programs. Sponsored by the National Academy for Vocational Education, the two-day workshop will emphasize the role of the resource person responsible for facilitating preservice and inservice training of those who direct vocational programs.

Participants will learn the concepts of competency-based vocational administrator education using modularized, research-based materials and develop an action plan to take home for implementing an administrators' program.

Cost of the workshop is $125. To find out more, write or call *Barbara Kline, OE, Coordinator, Institute Program, National Academy for Vocational Education, National Center for Research in Vocational Education, Ohio State University, 1960 Kenny Rd., Columbus, OH 43210; (614) 486-3655 in Ohio, 1-800-848-4815 out of state.*

CODE IT OE

You may notice in this issue that the contact person listed at the end of each item has an additional title following his or her name—OE. No, sorry, it isn't an abbreviation for Omniscient Educator. It stands for *OPEN ENTRIES* and is a cue for the contact person and us that will help track the number of responses to items appearing in your exchange periodical. Please use the code in addressing written communication to a contact person, and if you talk to a contributor on the phone, be sure and tell him/her you saw it in *OPEN ENTRIES*!

Sponsored by the Communication Network for Competency-Based Vocational Education

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OPEN ENTRIES is promulgated at an annual cost of $9,214.00, or $0.594 per copy, to provide educators with an information system for exchange of competency-based instructional materials and methodology.

OPEN ENTRIES Sept. 1982

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marketing and distributive education, allied health education, business and office education, vocational home economics education, technical education, and trade and industrial education. For each cluster a teacher's resource guide is available for $9.75. The guide explains the series design, lists the modules for that area, and includes a sample module. Considered appropriate for use in secondary, postsecondary, and adult vocational education programs, the materials are intended to offer the greatest flexibility for incorporating specific content into different instructional settings. For more information, write or call *Bruce Lube, OE, Project Director, Center for Occupational Research and Development, 601 Lake Air Dr., Suite C, Waco, TX 76710; (817) 772-8756.*

Methodology

A one-page questionnaire designed to allow students to rate the quality of their learning modules is available from the Stephenson Area Career Center. The **Student Learning Guide Evaluation Form** includes 14 yes-or-no questions, with room for comments, about a module's organization and information, the availability and helpfulness of its written and audiovisual resources, and the clarity of its written test. For a copy of the form, write or call *Dick Linnell, OE, Assistant Director, Stephenson Area Career Center, Pearl City Road, Freeport, IL 61032; (815) 235-8025.*

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Competency-based learning modules for upgrading the skills of vocational educators who develop curriculum are available from the East Central Network for Curriculum Coordination (ECNCC), one of six federally designated regional networks. The **Vocational Education Curriculum Specialist** (VECS) series includes 16 modules, a teacher's guide, an audiotape, and a national field-test report. Developed under a federal contract by the American Institutes for Research in Palo Alto, California, the modules are intended for use in both preservice and inservice teacher and administrator education. The first module gives an overview of the major roles and functions of curriculum development in vocational education. The next five modules provide a "foundation series" in the history and philosophy of vocational education in the United States. Five following modules concentrate on tasks directly related to the preparation of instructional materials, and the final five modules deal with the administrative skills associated with developing and managing curriculum. The teacher's guide is designed to help educators set up and manage professional development programs that focus on curriculum development skills. Total cost for the VECS series is $35, but individual modules can be purchased for $4 each. To order and for more information, write or call *Rebecca Douglass, OE, Director, ECNCC, Sangamon State University, E-22, Springfield, IL 62708; (217) 786-6375, 1-800-252-8533 in Illinois.*

MATERIALS WANTED

CBVE - General

We currently do a great deal of aptitude/achievement screening of adults for CETA-sponsored job training programs. We would be interested in knowing what assessment instruments, other than the Test of Adult Basic Education (TABE), you've used successfully in **guiding adults into competency-based vocational education**. We would be glad to share information about what we're doing related to competency-based training. If you can help, write or call *Linda Dowell, OE, Tri-County CETA Program, P.O. Box 226, Auburn, ME 04210; (207) 786-0166.*

Specific Program Areas

We're interested in competency-based materials, such as performance objectives, learning activities, and performance checklists, for both secondary and postsecondary training in the following occupational areas:

Air Conditioning and Refrigeration
Automotive Body Repair
Residential and Industrial Electricity
Masonry
Machinist Training

If you can help, write or call *Ed Henderson, OE, Coordinator, Occupational Education Articulation Program, Donaldson Vocational Center, Greenville County Schools, Box 2848, Greenville, SC 29602; (803) 242-6450.*

●

We're interested in task lists, performance objectives, curriculum guides, and learning modules for competency-based training in the occupations of **Cable Television Technician, Electronics Technician, and Word Processor Operator.** If you can help, write or call *Jane Bustamante, OE, Pima Community College Skill Center, 1859 W. Grant Rd., Tucson, AZ 85745; (602) 623-8456.*

●

We're interested in secondary-level task lists and learning modules for the health care occupations of **Medical Lab Assistant, Pharmacy Helper, X-ray Technician's Assistant, Dietary Aide, and Respiratory Therapy Aide.** If you can help, write or call *Julie Cave, OE, Health Occupations Unit, Kentucky Education Department, 2121 Capitol Plaza Tower, Frankfort, KY 40601; (502) 564-3775.*

●

We're interested in a task list, learning modules, and related audiovisual materials for postsecondary competency-based instruction in **Child Care**, an associate degree program in early childhood education. If you can help, write or call *Nan Briggs, OE, Assistant Professor, Early Childhood Education Department, Villa Maria College, 2551 W. Lake Rd., Erie, PA 16505; (814) 838-1966.*

●

We're interested in any competency-based materials for training in the use of specialized computer-based or computer-assisted equipment found in the occupational field of **Drafting**. If you can help, write or call *Jim Vanderoest, OE, Industrial Arts Instructor, Gulf Coast Community College, 5930 U.S. Highway 98 West, Panama City, FL 32401; (904) 769-1551.*

OPEN ENTRIES

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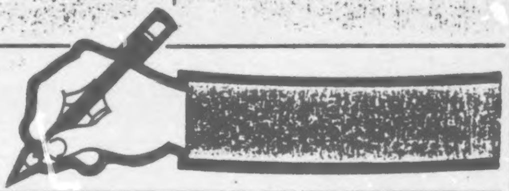

Just in case you haven't signed up yet, we've included this form. If you're already a subscriber/contributor, please pass along a duplicate of the form to a colleague. Thanks for your support.

Name, Position ______________________________

Institution ______________________________

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The fee for a year's individual subscription is $5.00. Special discount rates for multicopy subscriptions are $100 for 25 copies of each issue and $250 for 75 copies of each issue. Return your filled-in form and fee to Editor, *OPEN ENTRIES*, The Center for Studies in Vocational Education, Florida State University, Stone Building, Tallahassee, FL 32306. (*Make checks payable to OPEN ENTRIES.*)

ARTICULATED, PERFORMANCE-BASED
INSTRUCTION GUIDE FORMAT

FORMAT AND DESIGN

ARTICULATED, PERFORMANCE-BASED INSTRUCTION GUIDES

FORMAT

The format chosen for the articulated, performance-based instruction guides resulted from efforts to make the guides as easy to use as possible. Several guides from other articulation programs were reviewed and the best ideas from them were combined with ideas from participants in this articulation program. The instruction guide format, which evolved during the writing stage of the initial year of this program, is logically and mechanically arranged so that the guide can be easily comprehended and followed. As better methods of presenting the information are discovered, the format will be modified to better serve classroom instructors.

TERMS

For a definition of the terms used in the articulated, performance-based instruction guides, see the "Definition of Terms" in the Introduction section of this Policies and Procedures Guide.

Early in the project, the articulation program coordinator recommended the use of "performance-based instruction" and "outcome-referenced tests" in place of competency-based instruction and criterion-referenced tests. It is thought that "performance-based instruction" and "outcome-referenced tests" may be easier to define to instructor participants, students, and the general public. As much as possible, terms used in this program are chosen to represent an applied training approach to articulation compared to terms one might use in educational research.

GENERAL FORMAT

The articulation guides developed during the initial year of the program followed the same general format. Basically, there are two major products: An articulation guide for Drafting I and a guide for Business and Office Education. Both of these main products include an introductory section which describes the project and how the guides were developed. By including the Business and Office Education courses articulated as modules in one guide, it was necessary only to have one introductory section. Typewriting I is Module 1, Typewriting II is Module 2, and so on. Each of the Business and Office Education modules, a product within a product, can be lifted from the mother product and is entirely independent. For example, the Typewriting Guide consisting of Modules 1 and 2, Typewriting I and II, includes a contents page, introductory description, standards, and a bibliography in addition to the performance objectives. The Typewriting Guide is able to stand alone as a curriculum product.

Each of the guides followed a straight-forward format. Each contains a cover page; list of writers; contents page; appendix page; description of similar secondary and post-secondary programs; applicable standards; suggested instructional time summary; task listing (objectives) summary; individual performance objectives pages which include performance actions to reach the objectives, performance standards, related technical information, and other relevant information; sample tests; a suggested equipment list; references; and in some cases an appendix.

The "Course Descriptions" are taken from information found in the South Carolina State Department of Education publications, publications of The School District of Greenville County, and publications of Greenville Technical College.

"Standards" included in the guides are those recommended by business and industry as important to the success of entry level workers in the field of training be articulated.

The "Suggested Instructional Time" is that estimated by instructor participants as necessary to train average secondary level students, in an average instructional situation, to master the performance objective to a degree that will qualify the student for entry level employment.

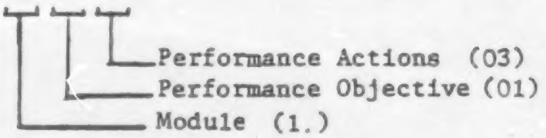
The "Task Listing" is a summary of the performance objectives which represent the major tasks or jobs of the vocational field as recommended by local businesses and industries to task force committee participants, through the process of task analysis. Typically, these major tasks are accomplished by the worker performing several minor tasks, jobs, or "performance actions" as they have been called in the guides. The Task Listing for vocational areas, such as Typewriting, typically should be similar at the secondary and post-secondary levels or in different geographical areas if the objectives of the training program or job are similar.

TASK NUMBERS

The task number system used with the articulated, performance-based instruction guides has been kept simple. Each module is given a number, such as 1., 2., etc. Each task is numbered consecutively, .01 to a maximum of .99. Each performance action of a task is numbered .0001 to a maximum of .0099. Outcome-referenced tests are given the same numbers as the matching performance objective or performance action. Thus, objectives, actions, and tests can be readily identified.

For example: In Module 1.0, Typewriting I, Task 1.0103 would be interpreted as follows:

TASK 1.0103



INDIVIDUAL PERFORMANCE OBJECTIVE DESCRIPTION

Each performance objective of the "Task Listing" is individually described on one or more pages in the main section of the articulated, performance-based instruction guides.

Page Identification. At the top of each page is found the identifying peformance objective (task) number and a description of the task.

Performance Objective Statement. The performance objective statement includes the conditions under which the performance is to take place, the behavior desired or expected of the student, and the standards to determine how well the performance is to be done.

Performance Actions. Following the performance objectives statement is a listing of "Performance Actions" or major steps considered necessary to accomplish the task or objectives. The performance actions are numbered for reference.

Performance Standards. The performance standards statements is the minimum acceptable performance considered necessary for entry-level job sucess in the vocational field.

Suggested Instruction Time. The suggested instruction time is for planning purposes only. The task force committee participants estimated that this is the time necessary for an average student, in an average instructional setting, to master the performance objectives to the recommended standards.

Related Technical Information. Related technical information is what the worker should know to be able to perform the task or it may represent recommended information that may make accomplishment of the performance objectives easier or more meaningful to the student.

Checklist(s). In some cases, checklist for performance are included as an aid to the instructor or student. Checklist may be used to evaluate student proficiency or to clarify to the student what steps should occur as the objective is reached.

OUTCOME-REFERENCED TESTS

Sample outcome-referenced (criterion-referenced) tests for knowledge and performance are included in the articulated, performance-based instruction guides. Some tests were developed by the task force committee participants. Other tests items refer to specific examples in recognized textbooks. At the recommendation of the task force committee participants, a few sample tests found in recognized textbooks currently used by secondary and post-secondary teachers are reproduced in the guide to facilitate articulation.

SUGGESTED EQUIPMENT

Equipment included in the "Suggested Equipment List" is that considered necessary to conduct training for average students in the average instructional setting.

BIBLIOGRAPHY, REFERENCES

In the Bibliography or References section of the guide, textbooks currently used for instruction and materials used for writing the articulated, performance-based instruction guides have been included.

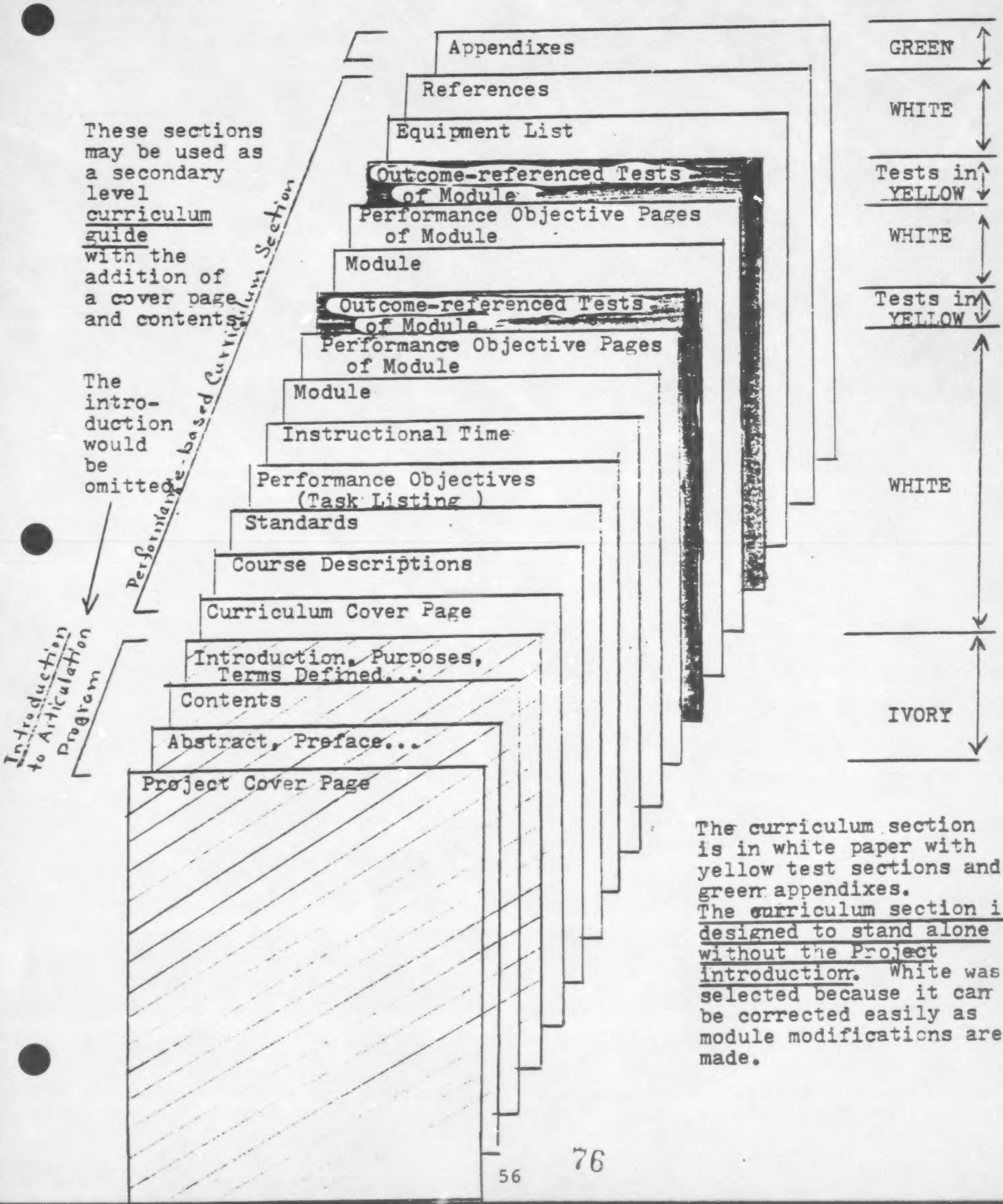
APPENDIX

An appendix may be included in the guide if there is information that may help the instructor or may be useful in future articulation activities.

SAMPLE FORMAT IN APPENDIX

A sample of the articulated, performance-based guide format is included in the appendix of this Policies and Procedures Guide.

BASIC ORGANIZATION OF ARTICULATED, PERFORMANCE-BASED INSTRUCTION GUIDE


Appendixes
References
Equipment List
Outcome-referenced Tests of Module
Performance Objective Pages of Module
Module
Outcome-referenced Tests of Module
Performance Objective Pages of Module
Module
Instructional Time
Performance Objectives (Task Listing)
Standards
Course Descriptions
Curriculum Cover Page
Introduction, Purposes, Terms Defined...
Contents
Abstract, Preface...
Project Cover Page
GREEN
WHITE
Tests in YELLOW
WHITE
Tests in YELLOW
WHITE
IVORY
Performance-based Curriculum Section
Introduction to Articulation Program

These sections may be used as a secondary level curriculum guide with the addition of a cover page and contents.

The introduction would be omitted.

The curriculum section is in white paper with yellow test sections and green appendixes. The curriculum section is designed to stand alone without the Project introduction. White was selected because it can be corrected easily as module modifications are made.

GUIDANCE AND ADMISSIONS CONSIDERATIONS
FOR
ADVANCED PLACEMENT CONSIDERATIONS

GUIDANCE AND ADMISSIONS CONSIDERATION

ADVANCED PLACEMENT STUDENTS

GUIDANCE CONSIDERATIONS

Senior and junior guidance counselors at the high schools, career or vocational center counselors, and appropriate post-secondary guidance counselors should be familiar with the articulation program so that they will be prepared to counsel a student who may wish to pursue advanced placement at the post-secondary level based on a demonstrated vocational proficiency. Secondary counselors, in addition, should be prepared to counsel student for lateral articulation if the student, enrolled in an articulated training program, transfers vocational high schools within the District during the school year.

Guidance counselors at the post-secondary level should be familiar with the articulation program and training areas articulated so that they will be prepared to assist students (a) applying for advanced placement standing during enrollment or (b) wishing to challenge a course for advance placement.

ADVANCED STANDING CREDIT

Appropriate quarter hour credit in an Associate Degree or articulated program of training should be granted by the post-secondary institution based on articulated course work of a similar type satisfactorily completed at the secondary level and for which the students received a "proficiency rating" which indicated that the student qualified for advanced placement. (See also the section of this document titled, "Proficiency Reporting.")

A student who completes a secondary level articulated program and demonstrate the competency to qualify for advanced placement in a similar area of training at the post-secondary level, should receive "priority enrollment consideration" if the student apply for admission to the TEC program by the next regular enrollment date within a six months period. Typically, the enrollment date will be the fall quarter term of the year that the student graduated from high school.

Ideally, a student who has demonstrated appropriate competency in their secondary level articulated vocational program should qualify for advanced placement with a minimum of further testing at the post-secondary level, unless the time limitation for the proficiency report has expired or the articulation process has not been proven valid.

Graduates of an articulated training program enrolling in a similar post-secondary program of training and who have demonstrated acceptable competency in the training should be invited by the post-secondary institution to challenge and test to exempt appropriate post-secondary level courses. At the same time, the post-secondary institution should be free to require a student requesting advanced placement to stand an exemption test prior to receiving advanced standing, if there is reasonable cause to question the advisability of advanced placement.

Inability to satisfactorily complete an exemption examination should require that the student be placed in the course that preceeded the course for which the exemption test was not completed satisfactorily. In addition, the post-secondary institution may require the student requesting advanced placement and not completing the exemption exam to satisfactorily complete exemption tests in prerequisite courses of vocational training. Placement testing, in addition, may help the instructor or guidance counselor as they advise the student concerning an appropriate vocational training program.

EXEMPTION TESTS

Test items for post-secondary exemption tests in articulated vocational training programs should be taken from the appropriate, performance-based institution guide. Outcome-referenced test samples have been included in the articulated curriculum guides for such purposes and should equal or exceed previously used exemption tests at the post-secondary level.

EXEMPTION TEST FEES

Exemption test fees currently vary with articulated programs at the post-secondary level. Testing fees typically may start at $10.00 per exemption test. Exemption tests that utilize an acceptable portfolio document of competencies may wave a testing fee. Exemption testing conducted by or for the post-secondary institution at the secondary level prior to the student completing a secondary level training program may omit testing fees.

ADVANCED PLACEMENT CREDIT LIMITS

For the student who has completed an articulated secondary program and demonstrated competency on a proficiency report or through exemption tests at the post-secondary level, there should be no limit on articulated, post-secondary level credit that the student may obtain based on competency in the vocation.

SKILL MAINTENANCE TRAINING FOR ADVANCED PLACEMENT STUDENTS

The student who by proficiency report or exemption test receives advanced placement in an articulated training program should be enrolled in a minimum of one "skill development course" during the initial quarter of post-secondary training or they should be provided with a means of maintaining the competencies developed. Such provisions will ensure that the student's competencies do not deminish with infrequent use and that the student's interest and motivation for additional specialized occupational training is encouraged.

STUDENT CHALLENGE OPTION

Experience indicates that the practice of advanced placement can be inhibited by complicated qualifying procedures. The School District of Greenville County and Greenville Technical College have made an effort to remove or reduce apparent potential inhibitors to articulation for the student who may qualify for advanced placement when continuing training in an articulated program. It is recommended that the post-secondary institution continue the practice of allowing students the opportunity to demonstrate their occupational competencies or to "challenge" a course in order to qualify for advanced placement.

CONTINUING COORDINATION OF ADVANCED PLACEMENT IN ARTICULATED PROGRAMS

At periodic intervals, procedures whereby Greenville Technical College assigns advanced credit for training previously mastered at the secondary level will require refinement. At least every two years and preferably yearly, all staff and faculty concerned should be involved or represented in the establishment or modification of performance criteria for given courses in the articulated training programs and in the Policies and Procedures Guide for Articulation.

It is recommended that appropriate staff of The School District of Greenville County and Greenville Technical College meet periodically to exchange information on curriculum programs and requirements, identify common learning objectives, compare notes on their respective assessments of job entry-level skill requirements, and review procedures used in awarding credit for prior learning experiences. This recommendation suggests that administrative, instructional, and guidance personnel from both institutions should be involved in revising and planning articulation activities.

ADVANCED PLACEMENT/INDIVIDUALIZED INSTRUCTION

A student awarded advanced placement in articulated vocational training programs at the post-secondary level based on proficiency reports or exemption examinations may require individualized instruction if there are no special arrangements made for the student to continue skill training while waiting to enroll in the next vocational course the student's specialization. For example, students may exempt one or more consecutive courses of training at the post-secondary level. The student should not have to wait until the next course of training is offered to continue occupational preparation. Currently, some

80

post-secondary instructors provide individualized training during the period the exempted courses are offered. It may become necessary, however, to provide professional assistance to instructors responsible for advanced placement students during the period when the exempted courses are offered. Individualized training generally requires preparation and supervision time, especially if individualized training generally requires preparation and supervision time, especially if individualized materials must be developed. Several advanced placement students, theoritially, could place an unfair burden on one instructor if the instructor had to prepare individualized training programs for the students.

GRADING

It is not within the framework of the articulated, performance-based instruction guides to address student grading.

Grading is the responsibility of the individual teacher and should reflect established school policies and practices. It is possible that a student might receive a passing grade but might not have completed required competencies. In such as case, the competency reporting form or checklist should be used to communicate to the student, teacher, or potential employer those skills the student has mastered.

The letter grade a student receives may not represent job skill mastered by the student!

The sample test items in the outcome-referenced measures section of the instruction guides are designed to articulate the standards and measures for minimum competency in the vocational field.

It is important to the success of the articulation program and the performance-based instruction concept that the teacher credit a student only with those competencies that the student demonstrated according to the stated criteria.

LOWER QUALIFICATIONS IN SECONDARY LEVEL TRAINING

The main purpose of the secondary level vocational program is to provide a system where the student can achieve knowledge and skill competencies to qualify for entry level employment. Students who do not demonstrate proficiency in all objectives of the program of training but who become proficient in limited skill areas may qualify for a lower level job in the vocation. Typically, such lower level job competencies will be developed in recognized modules of the overall vocational program. Most students, during their one to two years of training, will have achieved lower levels of competency prior to the final proficiency level they master. Students should be encouraged to continue their vocational training so that they will be prepared to succeed in a competitive job market.

PREPARATORY RECOMMENDATIONS NOT INCLUDED IN INSTRUCTION GUIDES

The articulated, performance-based instruction guides, describe the secondary level vocational program articulated and the similar areas of training at the post-secondary level. The guides do not include recommendations concerning preparing students for post-secondary programs. Such preparatory activities, however, currently are practiced at the secondary level in the guidance as well as the instructional programs. Where specific prerequisites are identified to qualify for advanced standing enrollment in an articulated, post-secondary program, the prerequisites will be included in the articulated instruction guides.

COUNSELOR'S GUIDE TO ARTICULATION

A Counselor's Guide to Articulation included appropriate exerts from the Policies and Procedures Guide was developed to provide all high school and vocational counselors with an orientation to the Occupational Education Articulation Program, especially as it related to the recordkeeping and transmittal of student competency information.

In addition, the Counselor's Guide to Articulation contained syllabuses of the articulated, performance-based vocational education programs completed.

This document provided the counselors at both the secondary and post-secondary levels with all the necessary information to counsel students interested in exempting post-secondary training based on competencies demonstrated during secondary training.

SECONDARY GUIDANCE PROCEDURES FOR USE OF PROFICIENCY REPORT

The purpose of these procedures is to facilitate a smooth transition of the student's performance-based vocational education record (Proficiency Report) from the secondary school to the post-secondary institution or industry according to Articulation Program procedures.

The secondary instructor's "working copy" of the Proficiency Report, initiated at the beginning of the school year, should become a part of the instructor's recordkeeping. (The instructor may wish to place the working copies in a loose-leaf binder for ease of handling.)

RECOMMENDED METHOD OF FILING PROFICIENCY REPORTS

The Proficiency Reports should be brought up-to-date for each student as the student demonstrates competency in the tasks identified. At the completion of the course, a permanent Proficiency Report, in triplicate, should be completed by the instructor. The three copies of the permanent report should be distributed as follows:

Copy 1 Copy one should be placed in student's permanent record file at the secondary level vocational center, if such files are maintained.

If the vocational course is conducted in a high school environment, the copy may be retained by the instructor or placed in a department file.

Copy 2 Copy two should be forwarded to the appropriate high school guidance counselor who will place the Proficiency Report in the student's permanent record file, preferably attached to the student's transcript.

Copy 3 The third copy should be marked "UNOFFICIAL" and given to the student.

ALTERNATE METHOD OF FILING PROFICIENCY REPORTS

Step 1 To reduce recordkeeping, an alternate method of filing Proficiency Reports at vocational centers might be for instructors to submit legible working copies of Proficiency Reports, arranged alphabetically, to the guidance counselor of the vocational center for filing. The Proficiency Report could be placed in the student's permanent records at the vocational center for future reference.

Step 2 Students who have completed an articulated vocational program and who need an official Proficiency Report could request the report directly from the vocational center from which the student completed training. The guidance counselor or staff at the vocational center could be responsible for making an official copy and transmitting it as requested. The vocational center would be responsible for supplying an official copy of the Proficiency Report to the feeder high school upon request.

Only official copies of the Proficiency Report, sent by the high school or vocational center, should be recognized for advanced placement by the post-secondary institution.

It is recommended that the instructor arrange Proficiency Reports in alphabetical order before submitting them to the guidance counselor(s) at the end of the school year. For two-year vocational courses of training, the Proficiency Report should be held until the student has completed the second year of training, unless the student transfers to another school prior to completing the training or requests that a Proficiency Report be sent to TEC or a potential employer.

The procedures for sending Proficiency Reports from vocational centers to feeder high schools for filing in permanent records, should be arranged between the schools within existing procedures or policies.

POST-SECONDARY ADMISSION OF APPLICANTS THROUGH THE ARTICULATION PROGRAM

The purpose of these procedures is to guide the admissions to Greenville Technical College of applicants who request advanced placement based on the completion of articulated vocational training at the secondary level, The School District of Greenville County.

Students who graduate from any articulated vocational training program of The School District of Greenville County and who demonstrate the required competency may be permitted to exempt one or more quarters of designated courses that are similar to the secondary articulated training.

REGULAR ADMISSION

Greenville Technical College follows as "open door" policy and does not refuse anyone admission to the school on the basis of test scores or grades. When scores on placement tests indicate that the applicant is not prepared to enter a particular program, the applicant will be offered the appropriate course or courses to give the individual the needed preparation.

Applicants for admissions should contact the Admissions Office as early as possible to discuss specific admissions criteria for each department of study. The Admissions staff will assist the applicant in completing the admission procedures.

Being a "regular student" means that the student is working toward a degree or diploma.

OTHER ADMISSIONS CATEGORIES

For various reasons, students who have participated in the Articulation Program at the secondary level may want to attend Greenville TEC and not earn a degree or diploma. In cases of this nature, an articulation student, like any student, may be admitted in a special student category. Special students are required to complete a Greenville TEC application and submit the required instructional fee deposit.

A student may be admitted under the early admissions program (if the student is under 18 years of age and not a high school graduate) by meeting all requirements for regular admission plus a letter of permission from the student's high school principal or guidance counselor.

ADVANCED STANDING

Students participating in the Articulation Program will be required to submit to the Admissions Office an official copy of their "Proficiency Report" issued by the instructor of their articulated secondary vocational program. The Proficiency Report will be forwarded to the Department Head or Advanced Standing Coordinator for review. The Department Head will indicate the competencies on the student's Proficiency Report that will transfer into similar TEC courses.

The Department Head will notify the Admissions Office concerning the advanced placement decision. Admissions will make the appropriate notation in the student's transcript so that credit for the courses exempted by advanced placement based on the Proficiency Report, Portfolio, or Exemption Tests will be recorded. Exempted course should be indicated on the permanent transcript by an appropriate code, such as "E."

SUGGESTIONS TO ADVANCED PLACEMENT APPLICANTS

The following steps are suggested to secondary level vocational students who plan to apply for advanced placement at Greenville TEC.

1. By the middle of the senior year, ask the secondary vocational instructor or counselor to contact the appropriate Greenville TEC technical division counselor to make an appointment for the student to visit the articulated post-secondary program at TEC.
2. An appointment should be made by the Greenville TEC counselor for the student to meet with the technical division department chairman/head during the visit.
3. The TEC counselor can arrange for the student to take the advanced placement exemption test that may be required by TEC.
4. The TEC counselor, department head, or program instructor should clarify to the prospective student what are the minimum requirements for advance placement.
5. If an exemption test is administered, the TEC counselor or the program representative should evaluate the test results with the student and advise the student concerning recommended placement in the TEC articulated program.
6. The student should request the secondary level vocational instructor or counselor to send the required Proficiency Report, recommendations, or transcript to the TEC program department head.

7. If suggested by TEC program department head, the student should prepare and submit a required portfolio or examples of practical experience work to illustrate competency in the areas for which advanced placement is requested.

PROFICIENCY REPORTING

PROFICIENCY REPORTING

One purpose of articulation is to enable students, upon graduation with an acceptable mastery of skills and knowledge from an articulated secondary level vocational training program, to continue their vocational training at the post-secondary level with a minimum of duplication of training.

To achieve an reduction in training duplication, articulated, performance-based instruction guides have been developed jointly by The School District of Greenville County and Greenville Technical College to provide standardization in instructional objectives, important task actions, standards, and outcome-referenced measures. Performance standards applied are those required for entry level job success. Test items are task performance directed to determine that the individual is qualified to execute job tasks organic to the duty area of the activity related to the course of instruction.

Reporting student knowledges and skills competencies is a critical element in the articulation process. The reporting process should (1) communicate to the student the degree to which certain skills and knowledges have been mastered, (2) build confidence and rapport between secondary and post-secondary level instructors, and (3) communicate to potential employers the entry-level vocational competencies that the student has mastered.

In short, the proficiency reporting process and instrument are communications tools to inform the student, educator, or potential employer of the level of the student's vocational skills mastery at a stage of the student's training, (generally at the end of the secondary level training program).

Generally, course grades are not designed to communicate specific skills proficiencies and should not be interpreted to indicate performance although there probably will be a correlation. The proficiency report, however, is designed to indicate actual levels of demonstrated competency in vocational training at a specific time. For example, a student who has completed a vocational training progam in automotive mechanics, in the instructor's opinion, may not have competency in general automotive mechanics when the proficiency report is completed. The student, however, may have completed satisfactorily the course of training, but may have demonstrated proficiency only in front-end alignment or brake servicing. While the student has completed the training program satisfactorily, the student's task competencies may be at different levels of mastery. The proficiency report instrument should clarify to the student as well as to others the entry-level vocational competencies the student has mastered.

The proficiency reporting process should assist the instructor by providing documentation for the grading of students and should not interfer with the instructor's current grading procedures. The proficiency report is not designed to replace the existing grading system used in the secondary vocational education program.

The existing grading process should continue to be used according to School District policies and procedures. Proficiency reporting will be in addition to the existing grading program; however, proficiency reporting should complement or strengthen the existing grading system. First, proficiency reporting should provide a system of sequential checks to acknowledge student mastery of minimum vocational skills and knowledge for entry-level employment qualification in the vocational field. Second, since most skill training involves some method of recordkeeping to substantiate the grading process and chart proficiencies, the proficiency report basically is a means of standardization of what already should be in practice and the time required to maintain the system should be no more than the time previously invested in similar recordkeeping methods.

The proficiency report process and instrument should be clear, concise, and easy for instructors to use. If the proficiency report instrument proves to involve excess instructor time during field trial use, it should be redesigned.

The proficiency report has been designed so that it can be easily read and understood by a prospective employer who may be unfamiliar with the articulation program. A cover sheet accompanies the proficiency report and interprets the proficiency levels.

The design of proficiency reports vary. Some may be checklists with either a "yes" or "no" indication of proficiency. Others may be rating scales which involved more instructor time and which sometimes are more subjective. Proficiency reports used with this articulation program typically will report major tasks (objectives) of the job and important actions (tasks) to obtain those objectives. Subjective ratings such as "satisfactory" and "outstanding" will be avoided. To broaden the communications spectrum of the proficiency report instrument beyond the skill or no skill range, a descriptive coding to identify performance levels has been designed. The following description of proficiency levels is suggested as a starting point.

COMPLETING THE PROFICIENCY REPORT

INSTRUCTIONS

1. The purpose of the proficiency report instrument is to communicate to other instructors or potential employers as well as to the student the abilities that a student has demonstrated to the instructor in vocational training.

2. It is important that each task be marked or checked as soon as possible after instruction.

3. If no instruction is aimed at proficiency in a task or if only an orientation or introduction to a task was provided, EITHER DO NOT MARK a proficiency level number or mark Level 0.

   A student who has no proficiency levels indicated for certain tasks should be considered as needing instruction or practice in those tasks not marked.

   Level 0 indicated that no proficiency instruction was given.

4. Levels 1-4 indicate that instruction was given to the student and the proficiency level may be interpreted as follows:

DESCRIPTIVE CODE

Level 0	Skill not applicable. No proficiency instruction given in task.
Level 1	Student has not demonstrated a proficiency in the task even though instruction has been provided. In the instructor's opinion, the student has not shown proficiency in the task and further instruction or practice in the skill is needed or recommended. The student need not be considered for exemption from instruction or for advanced standing.
Level 2	Student has demonstrated some proficiency in the task, but requires continuous assistance or supervision. The student has little proficiency in the task and can benefit from further instruction or practice in it. The student probably need not be considered for exemption from instruction or advanced standing.
Level 3	The student has demonstrated proficiency in the task with only occasional assistance and supervision. The student has ability in the task and may or may not benefit from further instruction or practice in it.

The student probably needs no further instruction or practice in the task and may benefit from exemption from instruction or for advanced placement. Advanced placement, however, should be a bilateral decision.* Testing the student in selected tasks may help the receiving instructor/institution decide whether to require further instruction or practice in such tasks.

Level 4 The student has demonstrated proficiency in the task without assistance or supervision.

The student is skilled in the task and needs no further instruction or practice in it.

The student needs no further training or practice in the task and is qualified for exemption from instruction or advanced standing based upon a "bilateral decision at the receiving institutions."*

*Effective advanced placement should be a "bilateral decision." The receiving post-secondary institution or instructor must determine a student's competencies and prescribe appropriate instruction. The student should feel confident of his/her abilities and of the placement. Students should have the option of requesting lower program placement at the post-secondary institution, however, counselors will encourage students not to choose an entry-level lower than the one prescribed.

Prospective employers interpreting the proficiency report may apply the following interpretation to the levels of proficiency.

Level 0	No skill level demonstrated or proficiency training not given in the skill.
Level 1	Individual's skill level is not that generally expected for entry-level employment.
Level 2	Individual's skill level probably is that generally expected for entry-level employment, but the individual probably will need close on-the-job supervision for a while longer.
Level 3	Individual's skill level is that generally expected for entry-level employment.
Level 4	Individual's skill level is equal to that of a worker with some on-the-job experience.

A sample "performance report form" follows for illustration.

COVER PAGE
# TO
PROFICIENCY REPORT
for

____
Vocational Course

Student: ________________________

High School: ________________________

Vocational Center: ________________________

Date Training Initiated: ________________
First Year Completed: ________________
Second Year Initiated: ________________
Second Year Completed: ________________

Instructor: ________________________

DIRECTIONS: The purpose of the proficiency report is to communicate to the student, other instructors, or potential employers the abilities that a student has demonstrated to the instructor in vocational training. Mark each task as soon as possible after instruction or skills demonstration. If instruction is not aimed at task proficiency, or if only an orientation or introduction to the task was provided, DO NOT MARK a proficiency level or mark Level 0. Levels 1-4 indicate that instruction was given and the proficiency may be interpreted as follows:

Level 0	No skill level demonstrated or proficiency training not given in the skill.
Level 1	Individual's skill level is not that generally expected for entry-level employment.
Level 2	Individual's skill level probably is that generally expected for entry-level employment, but the individual probably will need close on-the-job supervision for a while longer.
Level 3	Individual's skill level is that generally expected for entry-level employment.
Level 4	Individual's skill level is equal to that of a worker with some on-the-job experience.

For further description of the levels of proficiency, see "Proficiency Report" section of the Policies and Procedures Guide for Articulation Between The School District of Greenville County and Greenville Technical College.

Name ______________________________ Year ________________

Section __________________ Instructor ________________________

PROFICIENTY REPORT

AUTOMOTIVE MECHANICS

		Proficiency Level 0	Level 1	Level 2	Level 3	Level 4	Date Completed	Instructor's Initials	Student's Initials
UNIT 1.0	INTRODUCTION TO AUTOMOTIVE MECHANICS								
1.0 B	Demonstrated an understanding and working knowledge of safe practices in the shop. ( ) written test ( ) shop work								
1.0 F	Demonstrated proper selection, use, and maintenance of various hand tools used in shop. ( ) written test ( ) shop work								
1.0 F	Demonstrated proper selection, use, and maintenance of various power tools used in the auto shop. ( ) written test ( ) shop work								
1.0 H	Used shop manuals and technical publication handbooks, wiring diagrams, diagnosis manuals, Motors, Chilton and Glenn service manuals. ( ) written test ( ) shop work								
1.0 E	Used math skills for calculations involved in automotive service work. ( ) written test ( ) shop work								
1.0 E	Demonstrated ability to follow job procedures and completed job forms and records. ( ) written test ( ) shop work								
1.0 E	Identified ten different local service jobs and the training needed.								
1.0 I	ENGINE SYSTEMS/SERVICE								
	Performed cylinder leakage test.								
	Performed cylinder compression test.								
	Performed power balance test.								
	Performed valve cleaning and inspection.								
	Performed valve facing and rocker arm service.								
	Performed valve seating and assembly.								
	Performed valve guide wear checking methods.								
	R/R cylinder heads.								
	Adjusted valves.								
	Installed valve cover gaskets.								
UNIT 2.0	LUBRICATION SYSTEMS/SERVICE								
	Performed lubrication service and minor safety check.								
	Changed engine oil and/or filter.								
	Lubricated front suspension and steering leakage.								
	Adjusted and repaired front wheel bearings.								
UNIT 3.0	ENGINE MAINTENANCE, REPAIR, AND OVERHAUL								
	Diagnosed needed engine repairs using vacuum tests.								
	Dis/assembled and serviced major engine components.								
	R/R engine components.								
	R/R engine.								
	Diagnosed engine component malfunctions.								
UNIT 4.0	FUEL SYSTEMS/SERVICE								
	Adjusted carburetor and cleaned externally.								
	Cleaned or replaced fuel filter.								
	Inspected, serviced, or replaced carburetor air cleaner.								
	Rebuild carburetor: 1 venturi								
	2 ventori								
	4 venturi								
UNIT 5.0	EMISSION CONTROL SYSTEMS/SERVICE								
	Inspected exhaust components.								
	R/R individual exhaust components.								
	Demonstrated ability to safely use torch for heating and cutting.								

		Proficiency Level 0	Level 1	Level 2	Level 3	Level 4	Date Completed	Instructor's Initials	Student's Initials
UNIT 6.0 A	COOLING SYSTEMS/SERVICE								
	Inspected, adjusted, or replaced fan belts.								
	Checked coolant freezing point.								
	Pressure tested cooling system.								
	Replaced heater hoses.								
	Replaced radiator hoses.								
	Chemically cleaned and flushed cooling system.								
	R/R thermostat.								
	Inspected water pump for mechanical malfunction.								
	R/R water pump.								
UNIT 6.0 B	HEATER SERVICE								
	Diagnose heating system malfunctions.								
	R/R water heater hoses.								
	R/R water heater core.								
UNIT 6.0 C	A/C SERVICE								
	Pressure test and leak test AC system.								
	Inspect/recharge A/C system with refrigerant.								
	Check A/C system for satisfactory operation.								
	R/R A/C components.								
UNIT 7.0 A	BATTERY SYSTEMS/SERVICE								
	Demonstrated ability to interpret battery ratings.								
	Inspected and cleaned a battery.								
	Tested a battery with a hydrometer.								
	Tested a battery with a high rate discharge tester.								
	Performed a 3-minutes battery test.								
	Charged a battery.								
	Hooked up jumper cables correctly.								
UNIT 7.0 B	CHARGING SYSTEMS/SERVICE								
	Performed charging voltage output test with a voltmeter and evaluated findings.								
	Checked and adjusted alternator drive belt.								
	Performed charging system output test. (Used shop job sheet)								
	R/R alternator--generator.								
	R/R regulator.								
	Bench tested alternator and repaired as needed.								
UNIT 7.0 C	STARTING SYSTEMS/SERVICE								
	Performed starter current draw test.								
	Performed cranking voltage test.								
	Performed voltage drop test on starter cables.								
	Performed voltage drop test and continuity test on relays, solenoid, neutral safety switch.								
	Demonstrated ability to test armature and field windings with a growler.								
	R/R starter.								
UNIT 7.0 D	ELECTRICITY SYSTEMS/SERVICE								
	Performed continuity test.								
	Measured voltage drop across a component or connection.								
	Measured current flow in a circuit.								
	Measured resistance of a component.								
	Tested a diode and evaluated finding.								
	Soldered a splice and installed terminals and connectors.								
	Set up headlamp alignment equipment and evaluated readings.								
	Aligned headlamps. (single and/or dual)								
	Performed operational inspection of lighting system.								
	R/R flasher units.								
	Located and repaired shorts and opens in electrical circuits.								

		Proficiency Level 0	Level 1	Level 2	Level 3	Level 4	Date Completed	Instructor's Initials	Student's Initials
UNIT 7.0 E	IGNITION SYSTEMS/SERVICE								
	R/R spark plugs, clean, gap, and test.								
	R/R distributor points and condenser.								
	R/R distributor.								
	Removed and inspected distributor cap, rotor and cables.								
	Tested coil polarity and voltage output.								
	Demonstrated ability to trace a primary circuit.								
	Demonstrated ability to trace a firing order.								
UNIT 7.0 F	TUNE UP SYSTEMS/SERVICE								
	Performed minor tune-up and adjust according to manufacture specifications using hand held test equipment: timing light, tach-dwell, vacuum gauge.								
	Performed steps of major tune-up according to manufacturer specifications using an engine analyzer.								
	Checked distributor functions with distributor tester (option).								
	Performed infrared exhaust test and explained findings.								
UNIT 8.0 A	POWER TRAIN SYSTEMS/SERVICE								
	Changed rear axle lubricant.								
	Inspected and repaired universal joint.								
	R/R rear axle shaft and seal.								
	R/R drive shaft.								
Unit 8.0 B	TRANSMISSION, MANUAL								
	Adjust a clutch.								
	R/R clutch components.								
UNIT 8.0 C	TRANSMISSION, AUTOMATIC								
	Adjust and service automatic transmission.								
	R/R automatic transmission and components.								
	Overhaul automatic transmission.								
UNIT 9.0	TIRES AND WHEELS SYSTEMS/SERVICE								
	Demonstrated knowledge of tire nomenclature. (test)								
	Demonstrated ability to use tire changer: Manual								
	Demonstrated ability to use tire changer: Automatic								
	Performed tire balancing: Bubble								
	Performed tire balancing: Spin								
UNIT 10.0	SUSPENSION SYSTEMS/SERVICE								
	Lubricate suspension system.								
	Performed pre-alignment inspection for defective parts.								
UNIT 11.0	BRAKES SYSTEMS/SERVICE								
	Performed operational brake inspection.								
	R/R drum brake assembly.								
	Inspected and refinished brake drums.								
	Repaired wheel cylinder.								
	Replaced brake hoses, hydraulic lines, and fittings.								
	R/R wheel cylinder.								
	R/R master cylinder.								
	Inspected and replaced disc brake pads.								
	Inspected and refinished rotor. (Disc)								
	Repaired disc brake caliper.								
	Demonstrated correct procedure to bleed hydraulic brakes.								

		Proficiency Level 0	Level 1	Level 2	Level 3	Level 4	Date Completed	Instructor' Initials	Student's Initials
UNIT 12.0	Performed LEVEL I service: Lubrication, tire repair, brake adjustment.								
	Performed LEVEL II service: Minor repairs and tune-ups, R/R minor components, minor adjustments... typical of apprentice mechanic with one year of experience.								
	Performed LEVEL III repairs such as over hauled automotive systems, tested and diagnosed system and component malfunctions. R/R: carburetor, transmission, engine, electrical-ignition systems, etc. Entry level mechanic with two years experience.								

Narriative of Exact Skill Experiences of this Student:

		Proficiency Level 0	Level 1	Level 2	Level 3	Level 4	Date Completed	Instructor' Initials	Student's Initials
UNIT 13.0	Adjusted diesel fuel injection system.								
	R/R diesel fuel injection system injectors, Filters.								
	R/R and time fuel injection pump.								
	Calibrate diesel governor.								

Student: ______________________

PROFICIENCY REPORT

CARPENTRY

		TASK	Proficiency Level 0	Level 1	Level 2	Level 3	Level 4	Instructor's Initials	Date Completed
UNIT	1.0	INTRODUCTION TO BUILDING CONSTRUCTION							
	1.01	Review School Policies and Procedures							
	1.02	Orientation to Shop							
	1.03	Review Course Objectives and Standards							
	1.04	Identify Typical Building Construction Career Opportunities							
	1.05	Job Performance							
	1.06	Work Attitudes							
UNIT	2.0	CARPENTRY SAFETY							
	2.01	Classroom Safety							
	2.02	Use Personal Protective Equipment							
	2.03	Practice Safety in Using Power Tools (and machinery)							
	2.04	Ladder and Scaffolding Safety							
UNIT	3.0	BUILDING CONSTRUCTION I							
	3.01	Carpentry Math							
	3.02	Carpentry Math - Fractions							
	3.03	Carpentry Math - Decimals							
	3.04	Carpentry Math - Volumes							
	3.05	Carpentry Math - Areas							
	3.06	Carpentry Math - Angular Measurement							
UNIT	4.0	BLUEPRINT READING							
	4.01	Identify Working Drawings and Blueprints and Read Specifications							
	4.02	Interpret Common Blueprint Symbols Used in Residential Construction							
	4.03	Interpret Dimensions from Blueprints							
	4.04	Read Blueprint and Specifications and Estimate Lumber Materials							
UNIT	5.0	CARPENTRY HAND TOOLS							
	5.01	Identify and Demonstrate Proper Use of Carpentry Hand Tools							
	5.02	Read and Measure With Rules and Squares							
	5.03	Check Whether a Surface is Level or Plumb							
UNIT	6.0	FASTENERS, FINISHING, AND HARDWARE							
	6.01	Fasten Stock Using Glue, Nails, Staples, Screws, and Bolts							
	6.02	Install Wood Plugs in Prepared Holes							
	6.03	Fill and Finsih Nail and Screw Holes							
	6.04	Sand Surfaces for Finishing							
UNIT	7.	PORTABLE POWER TOOLS							
	7.01	Drill or Bore Holes With Portable Electric Hand Drill							
	7.02	Cut Stock With Portable Electric Saws (Circular, Sabre, and Reciprocating)							
	7.03	Rout Irregular Edges With Portable Router							
	7.04	Plane Stock With Portable Electric Plane							
	7.05	Sand Surfaces and Edges With Belt Sander and Finishing Sander							
UNIT	8.0	STATIONARY POWER TOOLS							
	8.01	Demonstrate Use of Table Saw							
	8.02	Demonstrate Use of Radial-Arm Saw							
	8.03	Demonstrate Use of Drill/Drill Press							
	8.04	Demonstrate Use of Jointer							
	8.05	Demonstrate Use of Planer							
	8.06	Demonstrate Use of Band Saw							
	8.07	Demonstrate Use of Router and Shaper							
	8.08	Demonstrate Use of The Belt Sander							
UNIT	9.0	SITE LAYOUT (SITE PLANNING)							
	9.01	Establish Site Property Lines							
	9.02	Demonstrate Use of Leveling Instrument							
	9.03	Locate Building Site in Relation to Property Line							
	9.04	Locate and Square Building Corners Using Builder's Level							
	9.05	Locate and Mark Excavation Lines							
	9.06	A & B Supervise Site Preparation (Dual Tasks)							
UNIT	10.0	FOOTINGS AND FOUNDATIONS							
	10.01	Install Batter Boards for Rough Excavation and Footings							
	10.02	Set Grade Stakes at Proper Elevations							

			Proficiency Level 0	Level 1	Level 2	Level 3	Level 4	Instructor's Initials	Date Completed
	10.03	Align Form Walls							
	10.04	Brace Foundation Wall Forms							
	10.05	Calculate Concrete for Footings and Foundation Walls							
	10.06	Clean and Repair Forms							
	10.07	Construct Concrete Step and Stair Forms							
	10.08	Construct Single Wall Foundation Forms							
	10.09	Build Side Forms							
UNIT	11.0	FLOOR AND SILL FRAMING							
	11.00	Construct Models to Illustrate Scaled Floor, Wall, and Roof Framing							
	11.01	Layout a Floor Frame							
	11.02	Cut and Install Sill Plates to Foundation Wall							
	11.03	Frame and Install a Builtup T-Type Sill							
	11.04	Frame and Install a Box Sill							
	11.05	Install Posts and Columns							
	11.06	Frame and Install a Builtup Girder							
	11.07	Install Floor Joists							
	11.08	Install Bridging Between Joists							
	11.09	Frame Floor Openings							
	11.10	Install a Subfloor							
UNIT	12.0	WALL AND PARTITION FRAMING							
	12.01	Layout a Wall Frame							
	12.02	Construct Corner Posts and T-Posts							
	12.03	Frame a Wall Opening							
	12.04	Install Door and Window Frames							
	12.05	Build Box Beams							
	12.06	Install Furring							
	12.07	Install Firestop							
	12.08	Install Structural Sheathing							
UNIT	13.0	ROOF FRAMING							
	13.01	Layout, Cut, and Install Common Rafters for Equal Pitch Roofs							
	13.02	Layout, Cut, and Install Ceiling Joist							
	13.03	Layout Common Roof Plan							
	13.04	Layout, Cut, and Install Cripple Jack Rafters for Hip and Valley Installations							
	13.05	Cut and Install Valley Rafters							
	13.06	Layout, Cut, and Install Hip Rafters for Equal Pitch Roofs							
	13.07	Cut and Install a Ridgeboard							
	13.08	Frame Roof Openings							
	13.09	Frame a Dormer							
	13.10	Frame Gable Ends							
	13.11	Cut and Install Collar Ties							
	13.12	Layout, Construct, and Install Roof Trusses							
UNIT	14.0	ROOFING							
	14.01	Apply Insulation (Underlay) for Asphalt Shingles							
	14.02	Install Composition Shingles							
	14.03	Layout for Bonding Shingles Over Dormers (or Other Roof Appendages)							
	14.04	Install Valley Shingles							
	14.05	Flash Chimney and Roof Vents							
	14.06	Flash Valleys							
UNIT	15.0	EXTERIOR FINISHING							
	15.01	Install Exterior Sheathing (Fiberboard or Plywood)							
	15.02	Frame a Boxed Cornice							
	15.03	Install Double-hung Windows							
	15.04	Install Exterior Doors							
	15.05	Install Prefabricated Storm Doors and Windows							
	15.06	Install Exterior Trim							
	15.07	Cut and Install Furring							
	15.08	Cut and Install Wood Paneling							
	15.09	Install Exterior Siding							
UNIT	16.0	INTERIOR FINISHING							
	16.01	Fit and Install Flexible Insulation							
	16.02	Install Prefinished Paneling							

			Proficiency Level 0	Level 1	Level 2	Level 3	Level 4	Instructor's Initials	Date Completed
	16.03	Cut and Install Furring							
	16.04	Cut and Install Solid Wood Paneling							
	16.05	Install Prefinished Hardboard							
	16.06	Install Drywall Board (Sheetrock) (Gypsum Wallboard)							
	16.07	Install Interior Doors							
	16.08	Install Door Lock Sets							
	16.09	Cut and Install Finish Flooring							
	16.10	Cut and Install Baseboards, Trim, and Molding							
	16.11	Cut and Install a Fireplace Mantel							
	16.12	Construct a Storage Closet							
UNIT	17.0	STAIR CONSTRUCTION							
	17.01	Calculate Riser Height							
	17.02	Layout, Cut, and Install a Straight Run Stringer							
	17.03	Layout and Install Stair (Carriage)							
	17.04	Layout, Cut, and Install Treads for Open Riser Stairs							
	17.05	Cut, Fit, and Install Balusters and Handrails							
	17.06	Fit Newel Posts in Open Stairs							
	17.07	Assemble and Erect Prefactricated (Mill-Built) Stairs							
UNIT	18.0	CABINETS AND BUILT-INS							
	18.01	Install Built-in Shelving and Cabinets							
	18.02	Assemble Cabinet Frame							
	18.03	Install Prefabricated Cabinets							
UNIT	19.0A	CABINETMAKING							
	19.01	Cut Face Frame Stiles and Rails							
	19.02	Cut End and Top and Bottom Panels							
	19.03	Cut Partitions and Sleepers							
	19.04	Cut Shelf Panels							
	19.05	Cut Skelton Frame Stiles and Rails							
	19.06	Cut Toe Board and Back Panel							
	19.07	Cut Casework Top or Countertop and Backsplash							
	19.08	Cut Drawer Front, Sides, Back, and Bottom							
	19.09	Cut Wood Drawer Guides							
	19.10	Cut Solid Doors							
	19.11	Rout or Shape Casework Components							
	19.12	Cut, Trim, Molding, and Edge Banding							
	19.13	Cut Sink Opening in Countertop							
UNIT	19.0B	CABINETMAKING							
	19.01	Assemble Face Frame, Panels, Toe Board and Skeleton Frame							
	19.02	Fasten Top or Countertop and Backsplash to Casework							
	19.03	Assemble Drawers							
	19.04	Install Drawer Guides							
	19.05	Hang Casework Doors							
	19.06	Install Shelving							
	19.07	Attach Trim, Molding, and Edge Banding							
	19.08	Install Casework Hardware							
UNIT	20.0	MECHANICALS AND MASONRY ROUGH-IN, FINISHING, AND COMPLETION							
	20.0A	Electrical - Mechanical							
	20.0B	Heating and Cooling - Mechanical							
	20.0C	Plumbing - Mechanical							
	20.0D	Masonry							
	20.0E	Termal Insulation							
	20.0F	Interior Finishing							
	20.0G	Exterior Finishing							
UNIT	21.0	FINISH CARPENTRY TASKS							
	21.01	Remove old Finish							
	21.02	Clean Wood Surfaces							
	21.03	Swell a Soft Wood Dent							
	21.04	Repair Furniture							
	21.05	Finish Stock							
	21.06	Paint Casework							
	21.07	Fabricate Furniture							

		Proficiency Level 0	Level 1	Level 2	Level 3	Level 4	Instructor's Initials	Date Completed
UNIT 22.0	ESTIMATING							
22.01	Interpret Blueprints							
22.02	Draw a Set of Shop Plans							
22.03	(For Casework) Make a Rod Layout							
22.04	Draw a Detailed Plan							
22.05	Estimate Materials From a Blueprint or Layout							
22.06	Estimate Materials Costs							
22.07	Estimate Labor Costs							
22.08	(Extension of Estimating)							
UNIT 23.0	PRACTICAL APPLICATION PROJECT							
23.01	Plan Practical Application Project With Instructor or Others							
23.02	Participate in Practical Application Project							
23.03	Successfully Pass Knowledge or Written Tests on Project							
23.04	Participate in Practical Training Situations							

Student: ____________________

PROFICIENCY REPORT

DRAFTING I

	TASK	Proficiency Level 0	Level 1	Level 2	Level 3	Level 4	Instructor's Initials	Date Completed
UNIT 1.0	CLASSROOM SAFETY							
UNIT 2.0	BASIC MATH REVIEW							
2.01	Fractions							
2.02	Decimals							
2.03	Volumes							
2.04	Areas							
2.05	Metric System							
2.06	Angular Measurement							
UNIT 3.0	DRAFTING I							
3.01	Introduction to Drafting							
3.02	Use and Care of Instruments							
3.0207	Reads and Uses Different Drafting Scales							
3.03	Clean Drafting Instruments/Equipment							
3.04	Applying the Alphabet of Lines							
3.05	Lettering, Freehand							
3.06	Lettering With Mechanical Devices							
3.07	Use of Drafting Machine							
3.08	Geometrical Constructions							
3.09	Sketching and Shape Description							
3.10	Multiview (Orthographic) Projections							
3.11	Principles of Diazo Reproduction Process							
3.12	Make Diazo Copies of Original Drawings							
3.13	Dimensioning							
3.14	Shop Processes - Machining							
3.15	Applying Tolerances							
UNIT 4.0	DRAFTING I							
4.01	Section Views							
4.02	Auxiliary Views							
4.03	Revolutions							
4.04	Threads and Fasteners							
4.05	Axonometric Pictorial Drawings							
4.06	Oblique Pictorial Drawings							
4.07	Perspective Pictorial Drawings							
4.08	Parallel Line Development							
4.09	Radial Line Development							
4.10	Intersections							
UNIT 5.0	DRAFTING I							
5.01	Working Drawings							
DRAFTING I	PORTFOLIO OF 1st YEAR DRAWINGS (SEE RECOMMENDATIONS)							
OPTIONAL TASK	Render Design Using Ink (Drafting I & II)							

Comments:

Instructor's Signature: ____________________

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USE OF RELEASE AND TRANSMITTAL LETTER FORMS

The proficiency report should not be provided from the secondary to the post-secondary level or to a potential employer unless the student or the student's parent or guardian, if the student is a minor, has signed the release.

The proficiency report should contain on the instrument or attached to it enough information to permit the receiving institution or potential employer to interpret the proficiency levels indicated.

The proficiency report should be made a part of the secondary student's file and released in photocopy form only on the request of the student/parent/guardian.

The proficiency report should be sent directly to the receiving school or potential employer for whom it is requested by the student/parent/guardian. It is possible that an unscrupulous student might attempt to change the information in the proficiency report if it passes through the student's hands before reaching the school or employer.

If a student transfers schools at the secondary level and has received a proficiency report and then receives further instruction in any task, a new proficieny report should be completed that reflects the student's new proficiency and skill levels.

Upon receiving the release form, the school (generally the guidance counselor) should indicate on the lower left portion of the form the date received, when the proficiency report was sent, and the person who sent it. The "Release" form should be filed as a record of the transmittal. To aid the sending school, a "Letter of Transmittal" form is suggested. The "Letter of Transmittal" form includes several option statements which may be checked to further clarify the proficiency report.

Option statement one of the "Letter of Transmittal" indicates that a proficiency report completed within the past six (6) months is attached. Option statement two indicates that the proficiency report is attached and the student successfully completed training, but recommends that the prospective employer or post-secondary institution consider further evaluation prior to making a placement of the student. Option statement three indicates that the student did not complete the program of training or did not graduate from the program and the proficiency report is either incomplete or not available.

Sample "Release" and "Letter of Transmittal" forms are included for illustration.

-RELEASE-

TO: Guidance Counselor

Student complete in full

High School or
Vocational Center: ______________________

This signed release gives permission to the school, The School District of Greenville County, to provide copies of the student's vocational training proficiency report or verbal/written report by the instructor to Greenville Technical College or to the potential employer indicated. The proficiency report will be so provided only on request of the student for whom the report has been completed.

The purposes of the report are: (1) for use in considering the student for advanced placement in a similar vocational training program at Greenville Technical College, (2) for use in considering the student for employment in a vocational trade similar to the training the student has received or (3) for articulation to other vocational training schools if the student laterally transfers schools at the secondary level.

If the student for whom the report is a minor, the release must be signed by the student's parent/guardian.

Student complete in full

STUDENT: ______________ LAST YEAR OF TRAINING: __________
Type or Print

VOCATIONAL PROGRAM COMPLETED: ______________________
Type or Print

INSTRUCTOR: ______________________
Type or Print

Student complete in full

Send one vocational training competency/proficiency report to:
( ) Greenville Technical College: Attention: ______________
( ) Potential Employer: ______________ Attention: ______________
Company
Address: ______________________

Student's Signature: ______________________ Date: __________
(Parent/Guardian if student is a minor.)

DIRECTIONS TO STUDENTS: Complete the blocked in areas fully.
DIRECTIONS TO COUNSELORS: Indicate the date received, date report was sent, and initial. File this form as a record of the transmittal.

Date Recd. __________
Date Sent __________
By: ______________

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CONFIDENTIAL

LETTER OF TRANSMITTAL

"REPORT OF ARTICULATED, PERFORMANCE-BASED TRAINING COMPETENCIES"

TO: ( ) Greenville Technical College
Attention: ______________ Department: ______________
P.O. Box 5616
Greenville, SC 29606

( ) The School District of Greenville County
School: ______________
Attention: ( ) Counselor or ( ) ______________

( ) Company ______________ Attention: ______________
Address: ________ City ________ State ___ ZIP ______

STUDENT: ______________
Type or Print
VOCATIONAL PROGRAM: ______________
Type or Print
YEAR COMPLETED/LAST TRAINING DURING: ____
SCHOOL: ______________
Type or Print

Instructor or counselor check appropriate paragraph(s): (See directions below.)

( ) Attached is a photocopy of the Proficiency Report of the student's vocational training competencies measured within the past six (6) months.

( ) The student has demonstrated the ability to meet entry-level job performance standards in the articulated program of instruction as indicated, but has not been tested in sufficient subject areas to be identified as qualified for a specific job recognized in the Dictionary of Occupational Titles (D.O.T.) The proficiences reported should be recognized as evidence of articulated instruction satisfactorily completed and should be utilized with other evaluation measures to determine qualification for entry-level employment or advanced placement in continued training.

( ) The student either did not complete the full training program or did not graduate from the program and the proficiency report is incomplete or not available.

INSTRUCTOR'S SIGNATURE: ______________
SCHOOL: ______________ DATE: ______
ADDRESS: ______________

DIRECTIONS: The instructor of the student is to check the appropriate area and attach a photocopy of the student's vocational training competency report to this letter for transmittal. If the instructor of the student is no longer at the school, the guidance counselor should complete the letter of transmittal based on school records.

PROFILING PROFICIENCIES

The sequential arrangement of the tasks in the articulated, performance-based instruction guides and proficiency reports may be structured so that a profile of student proficiencies or task qualifications may be charted.

Profiles of proficiencies should be of definite interest to potential employers since it will help them make a judgment about an individual's qualifications for employment.

Proficiency profiles could be of value to the student and instructor by identifying major strengths and weaknesses in a student's vocational training.

If the profile of proficiencies reveals that a student has mastered certain tasks but has weak skills in other task areas, the instructor and student could plan activities to strengthen skill weaknesses or broaden the student's training.

The profile of proficiencies should aid both the secondary level job placement counselors and guidance counselors as they counsel students for continuing education or entry-level job placement.

Post-secondary level counselors and instructors should benefit from a profile of proficiencies as they counsel student for continuing education or advanced placement and plan a program of instruction to best suit the individual's needs.

In addition, instructors could use student profiles to sample their training program to ensure major tasks are being covered sufficiently.

In short, a profile of proficiencies should benefit the student, teacher, and counselors, and potential employers.

To develop a profile of vocational proficiencies, the instructor should use the Proficiency Report which lists the vocational tasks vertically and the level of proficiencies horizontally. Related tasks should be grouped together to indicate a profile. Indicate the proficiency level of each task by a dot in the center of the block. Next, connect the dots by lines. The result will be a simple but effective proficiency profile by tasks.

PROFICIENCY REPORT
TYPEWRITING I

		TASK	Proficiencies Level 0	Level 1	Level 2	Level 3	Level 4	Instructor's Initials	Date Completed	
MODULE	1.0	TYPEWRITING I								
	1.01	Mastery of Machine Parts			●					
	1.02	Keyboard Use				●				
	1.0202	Machine Adjustments				●				
	1.03	Numbers, Signs, and Symbols					●			

PROFICIENCY EVALUATION AID

To assist vocational instructors in standardizing the proficiency evaluation of students and reporting that information using "proficiency report" form, a "Proficiency Evaluation Aid" chart has been developed for several articulated programs. This "Evaluation Aid" chart describes standards that instructors might apply in determining that a student's skill is level 0, 1, 2, 3, or 4. A sample chart is enclosed.

PROFICIENCY EVALUATION AID

This descriptive aid is designed to possibly assist the carpentry instructor in standardizing the proficiency evaluation of students.

PROFICIENCY	LEVEL 0	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
Description	No skill level demonstrated or proficiency training not given in the skill.	Individual's skill level is not that generally expected for entry-level employee.	Individual's skill level probably is that expected for entry-level employment, but the individual probably will need close on-the-job supervision for a while longer.	Individual's skill level is that generally expected for entry-level employment.	Individual's skill level is equal to that of a worker with some on-the-job experience.
		PLANNING PROJECTS			
Procedure	"	Did not work from a plan.	Some steps wrong or missing.	A few minor changes needed.	Plan completed; no changes needed.
Drawing	"	Incorrectly drawn poor dimensioning.	Able to use with some changes.	A few needed dimensions needed.	Able to use; no changes needed.
Design and usefulness of project/product.	"	Not usable for intended purpose.	Able to use with some changes.	No changes made; could be redesigned.	Well designed for purpose intended.
Problem-solving ability	"	Solved no problems.	Solved only easy problems.	Solved nearly all problems.	Solved all problems.
		CONSTRUCTION PROJECTS			
Appearance	"	Assembled poorly; not cleaned up.	Not very neatly assembled.	A few final touches needed.	Clean, neat, and commercial in appearance.
Method of building	"	Used own method; "cut and try".	Made poor use of methods shown.	Followed correct methods most of the time.	Use the demonstrated method.
Tools	"	Careless with tools.	Used tools correctly most of the time.	Correctly used tools at all times,	Correctly used and cared for tools at all times.
Materials	"	Wasteful and careless with materials.	Wasteful with materials at times.	Usually careful of materials.	Conserves materials at all times.
Accuracy of work.	"	Failed to meet specifications.	Work is approximately correct.	A few measurements are off.	Meets all specifications.
Working time.	"	Little or no effort made to use time wisely.	Time used fairly well.	Wasted small amount of time.	Used time to best advantage.

Adapted from: Feirer, John L., Woodworking for Industry, Technology and Practice, Teacher's Guide, Peoria, IL: Bennett Publishing Co., p. 14, 1979.

POTENTIAL INHIBITORS

POTENTIAL INHIBITORS OF ARTICULATION

Most articulation programs that involve curriculum modification experience inhibitors or obstacles to some degree, even after formal agreements have been signed. The following examples of potential articulation program inhibitors have been identified as typical problems experienced in similar programs or potential inhibitors suggested by participants in this program.

GENERAL

At the initiation of a performance-based curriculum development process, it is recommended that adequate reference sources be available. Available resources might include curriculum guides; current textbooks, workbooks, and sample tests; appropriate V-TEC catalogs; and data from industry or business concerning entry-level job requirements as well as typical job tasks and performance standards.

At the beginning of the process to modify curriculum programs into articulated, performance-based instruction, adequate information and explanation should be given so that task force participants fully understand the objectives of the articulation or curriculum development program, the purposes of the modified curriculum guides, and the tasks that will be expected of participants in the development of the instruction guides. If the task force participants fully understand the objectives of the program, how they will benefit from the instruction guides, and what is expected of them in the curriculum development process, they should support and participate in the articulation or curriculum modification activity with more enthusiasm.

If the articulated, performance-based instruction guide is to be a quality curriculum description rather than a checklist of objectives, then the project coordinator should schedule adequate time to prepare for, assist, and follow up task force committee activities. The time necessary to coordinate the development of an articulated, performance-based instruction guide will vary with the program of vocational training.

There may be a tendency for some secondary and post-secondary instructors to base their course content on personal opinion and experience or on one textbook rather than on area employer needs. Such a posture might inhibit articulation which emphasizes standardized program objectives, content, and performance standards. In addition, a program of vocational training that is not serving the needs of employers may be without a valid base.

Throughout articulation program activities there has been repeated emphasis by the program coordinator that standardization in program content and standards will not result in the loss of program flexibility to meet local area manpower needs. The articulated, performance-based instruction guides represent the minimum competencies that a student should master for enter-level employment. Instructors may exceed the minimum standards and will be encouraged to do so, especially with more able students. It is important that instructors and others keep in mind that the articulated guides are minimum standards.

If there is not sufficient follow-up of the articulation program and the application of the articulated, performance-based instruction guides, it may be uncertain as to the status of articulation implementation and the degree to which the guides actually have been used in instructional planning to ensure that content and standards are congruous in similar programs of training.

If secondary or post-secondary programs of training are coordinated with the minimum standards of the South Carolina State Department of Education or the South Carolina State Board for Technical and Comprehensive Education, there may be reluctance to vary from the standards (i.e., to modify course content to achieve articulation). Since the purposes of both institutions (and the articulated, performance-based instruction guides) are for preparing individuals for successful entry-level employment in the local labor market, there should be close similarities in training to provide the skills necessary for successful entry level employment.

At the secondary and post-secondary levels, vocational instructors reported that they have only a limited amount of time for curriculum development. Instructors may be reluctant to make the extra effort to work with counterparts outside the institutional setting, on their own time. This potential inhibitor can be overcome by the participating institutions providing time for the instructors at both levels of training to meet jointly for the purpose of curriculum planning and development.

Once the articulated, performance-based instruction guide has been developed, revised, and validated, the instructor can concentrate away from selected what to teach and can concentrate on how to present instructional material and motivate students.

Students who qualify for advanced placement upon graduation from the post-secondary level may not enter a post-secondary vocational training advanced course with a similar math and science preparation compared to post-secondary students who may have experienced of one or more quarters of post-secondary training prior to entering the advanced course.

While there is joint support of articulation at the state and local levels, there remains two distinct state educational agencies involved in administering secondary and post-secondary training programs. For a binding commitment to articulation, a formal agreement supporting articulation, should exist at the state as well as the local level.

During the summer months of the initial year, instructor task force committee participation appeared to be primarily a result of professional interest in their subject fields. Several participants, indicated that they were able to earn more from a summer job than the stipend ($25.00 in 1981) ($30.00 in 1982) paid by the project during the summer for a six hour day of committee work. A few teachers were not able to participate in summer committee meetings due to summer job responsibilities. It appeared that summer meeting dates immediately after or prior to the regular 180 day secondary level school year resulted in the best participation.

POST-SECONDARY LEVEL

Currently, post-secondary, vocational training programs at Greenville Technical College basically are "open entry" but not "open programs." The programs schedule at Greenville TEC may result in an advanced credit student not fitting the articulated program upon initial enrollment (i.e., The student who exempts a first quarter course, in order to maintain vocational skills, may have to repeat training already completed. The situation might be further complicated if the student exempted first and second quarter vocational courses at the post-secondary level and has to wait until the third quarter to continue vocational training.) The absence of a multiple-level entry program (open program) to achieve articulation is a situation that, ideally, should be resolved, within practical limitations, as the vocational articulation program is developed, proven workable, and expanded. Fortunately, Greenville Technical College, from its beginning, has been an innovative leader in vocational and technical training. The post-secondary level faculty has recognized this potential inhibitor and is doing an exceptional job of working with each advanced placement student individually. Until such time as it becomes feasible to provide multi-level entry programs at the post-secondary level. Greenville TEC should continue to provide the individual counseling and instruction that currently is working satisfactorily with advanced placement students.

Any tendency to reduce the exactness of proficiency reporting of articulated training by use of letter grades, such as A, B, C, and D, as an indication of student competency should be avoided. Although there generally may be a correlation between skills competency and letter grades, academic grades have not been designed to reflect a student's actual competency in job tasks. Grading, however, is not within the framework of the articulation program and remains the individual teacher's responsibility according to applicable policies and procedures. To help report student competency, a Proficiency Report has been developed for each articulated course of training. A standard of reporting using the Proficiency Report has been established. The Proficiency Report and the outcome-referenced (sample) tests upon which it is based will be validated during the field-trial year of each articulated training program. Acceptance of letter grades as an indication of competency in task performance should be considered a potential inhibitor or articulation.

SECONDARY LEVEL

At least one articulated, performance-based instruction guide developed through the Occupational Education Articulation Program was for a secondary vocational training program for which there was no accepted state curriculum guides in South Carolina. As state guides are developed or revised in the future, there may be the tendency to replace the articulated guides with adopted state guides rather than to modify the articulated guides to bring them into the broader framework of state guides. State curriculum guides should be evaluated against the objectives, performance actions, and standards which reflect the recommendations of local employers concerning the entry-level job skills needed.

The School District of Greenville County and Greenville Technical College are cognizant of the potential inhibitors that have been suggested from the experiences of similar projects and from participants in this program. Both institutions are working to reduce or remove potential inhibitors to articulation.

SUPPLEMENTAL SUGGESTIONS

NEED FOR MORE CONCEPT TESTING

A potential indirect inhibitor to lateral or vertical articulation as well as to proficiency reporting to potential employers may be identified in the area of competency testing. Many of the publications used in vocational programs and many of the tests developed by vocational instructors include more retention tests than transfer tests.

If a vocational education program was conducting most of its testing by using retention tests, it is probable that student might graduate with acceptable grades but unable to relate their knowledges and skills to practical situations in the work environment.

There is need to place more emphasis on transfer type test items in the evaluation of a student's vocational competency. This is not a local situation, since the majority of the vocational textbooks apparently emphasize testing at the less difficult levels of learning rather than at the concept level.

RECOMMENDATIONS

ARTICULATION OF ADDITIONAL PROGRAMS (See Figure 3)

During the first phase of the Occupational Education Articulation Program, 1981-1982, Drafting I, Typewriting I and II, Shorthand I and II, Accounting I and II, Office Procedures, and Business English were articulated.

During 1982-1983, the Program was expanded to articulate Auto Mechanics/Automotive Technology, Carpentry/Building Construction, Commercial Cooking/Food Service Technology, Welding, and Drafting II.

Further articulation has been planned with Air Conditioning/Refrigeration, Auto Body Repair, Electricity, Machine Shop, and Masonry if project funding allows.

If articulation is planned beyond fiscal 1982-1983 period of the Occupational Education Articulation Program, programs should be identified and resource materials such as textbooks, curriculum guides, and articulation samples should be obtained in advance so that task force committees will have ample materials with which to initiate the writing of curriculum documents.

TIME ALLOCATED FOR ARTICULATION DEVELOPMENT

The initial development of articulated curriculum documents probably should be allocated a minimum of twelve months provided there is an adequate scheduling of time for teacher participants to meet in task force committee during the initial year. If a full time technical writer/vocational curriculum specialist is not available, a minimum document development time of two years is recommended.

The actual length of the time necessary to develop an articulated, performance-based (competency-based) curriculum document will depend on the course of training being articulated. Some vocational courses involve more tasks than others and will require more writing and committee time. For most vocational courses, from one to two years should be adequate for the development of performance-based articulation guides. In addition, there should be a field-trial period of one to two years during which the articulated guides may be tested for validity and revised. In total, a minimum of two to four years should be allocated for articulating two year vocational programs.

Articulation of vocational training through the vehicle of performance-based (competency-based) instruction requires an appropriate investment of time by a program coordinator as well as by instructor participants. The program coordinator may be a full or part-time curriculum specialist or even unit administrators such as a vocational center director or principal.

If articulation is coordinated by a part-time curriculum specialist or if instructor participation time in task force committee work is limited, the development time for articulation should be adjusted appropriately.

The field-trial year is most important to ensuring that the tasks, actions, standards, and outcome-referenced tests are validated and are revised as necessary.

COORDINATION OF ARTICULATION ACTIVITIES

During the initial articulation of two or more training areas, a full-time coordinator position for planning and coordinating articulation activities is recommended. If the articulation process is to include developing curriculum documents, a full-time typist is recommended.

If the articulation program is coordinated and supported by part-time personnel, an appropriate adjustment in the time to develop the articulation process and articulation documents may be necessary.

Once the majority of vocational courses have been articulated, a proven articulation process has been documented, and formal agreements for articulation have been established, the continuation of articulation should be jointly transferred to personnel at the participating institutions.

A unit administrator, such as a principal or vocational director or department head, could function as articulation coordinator. These individuals, however, are likely to find that considerable more planning, coordination, and support time as well as clerical support time is required in curriculum modification or development than is permitted by their administrative and supervisory duties.

Ideally, continuing articulation activities might be coordinated by a vocational education curriculum specialist. The vocational education curriculum specialist's duties might include, but should not be limited to the following:

- planning, organizing, supporting, and controlling an education team activity to achieve desired objectives
- planning, organizing, and evaluating curriculum content and learning process to achieve sequential activities that facilitate the achievement of objectives
- analyzing present and projected needs of business, industry, training institutions, and learners
- learning, comparing, and analyzing various theories or curriculum development, management, and evaluation and adapting them for use in vocational-technical education
- coordinating the modification of existing vocational programs into articulated, performance-based instruction

CONTINUING EFFORTS

The modification of curriculum areas into articulated, performance-based instruction, the development of close communications between the participating institutions, the signing of formal articulation agreements, and the advanced placement of students in articulated training programs all indicate successful articulation. More important, however, will be the continuing efforts of faculty and administrators of the participating institutions in articulation to improve relationships among educators, students, and the public. As the interpersonal relationships between articulation participants is strengthened, the articulation process will be strengthened.

REPRODUCTION OF FIELD TRIAL EDITIONS

Reproduction of field-trial editions of the articulated, performance-based instruction guides and supporting documents was by "Xerox" process on one side of each page so that corrections and notes might be made on the backs of pages to facilitate revision of the documents at the end of the field trial period.

After the field trial period, revised documents should be reproduced using both front and reverse sides of the pages to keep the documents at a manageable notebook size.

AUDIO VISUAL ORIENTATION TO ARTICULATION PROGRAM RECOMMENDED

It is recommended that an audio-visual presentation be used to orient articulation program participants and others to the Occupational Education Articulation Program as well as to the responsibilities of the task force committee participants. In addition, an audio visual presentation of task force committee workshop information concerning the writing of objectives and outcome-referenced test items is recommended as a method of communicating considerable technical information in as brief a time period as possible with maximum clarity.

TASKS OF DEVELOPING OUTCOME-REFERENCED TESTS MAY BE EXPENDED INTO DEVELOPING "TEST BANK" OF COMPETENCY TEST ITEMS

Since vocational instructor participants in the articulation program have developed skills and knowledges in developing valid outcome-referenced test items during their task force committee work, it is recommended that they continue their test item development work by developing a "TEST BANK" of valid outcome-referenced test items.

The items might be submitted periodically to the articulation program coordinator for filing, sorting, reviewing, reproduction, and distribution or to another repository.

The availability of a TEST BANK of validated outcome-referenced test items should result in requiring less time on part of vocational instructors to prepare competency tests. Thus, the instructors might concentrate more on planning and preparing for the instructional process as well as for motivating students.

New instructors to a vocational program could draw from the TEST BANK and ensure that the standards for the vocational program were continued at the level established by the vocational program task force committee in conjunction with potential employers.

ADDENDUM RECOMMENDATIONS

Additional recommendations may be added to this Policies and Procedures Guide through revisions or as additions to the appendixes section of the Guide.

Surveys of articulation program participants and field trial experiences will yield recommendations that will be included as this guide is revised periodically.

PREPARATION AND STORAGE OF DOCUMENT MASTERS BY WORD PROCESSING

There was need for the Occupational Education Articulation Program to be able to store the articulation documents so that they might be retrieved easily, revised, and produced as master copies for reproduction. The Word Processing Department of The School District of Greenville County answered this need by placing the documents on magnetic tape for permanent storage, future editing and revising, and production of masters.

The Word Processing Department was most cooperative in accepting the large volumes of material produced by the articulation program and integrating the articulation guides and supporting documents into the Department's normal work load.

The actual task of placing the documents correctly on magnetic tape, however, proved to be more difficult than was anticipated.

The articulation program secretary prepared the documents in final draft typewritten form and submitted them to Word Processing exactly as they should appear. Word Processing placed the material on magnetic tape for permanent storage and for easy retrievel and revision. Corrected drafts were produced for a master reproduction copy. The process, however, was not without minor delays. Documents were recorded with format and typographical errors, corrections were not made, and copies were returned without adequate proofreading. Although final draft copies were submitted to Word Processing, correction drafts were returned rather than finished copies which required additional steps in editing and word processing. NOTE: This observation is not a criticism of the fine staff of the Word Processing Department. The staff was most cooperative in attempting to provide an efficient and quality service. Citing this observance, however, may assist others in the future in the process of retrieving, revising, and reproducing articulation documents.

The following are possible factors that may have contributed to the situation described above: (1) The documents were massive in volume compared to the typical work load of the Word Processing Department. Six to eight documents averaging 100 to 500 pages each were submitted during the months of March to May of the project period. While every opportunity was explored to submit the documents in phases rather than in mass, the bulk of the documents were not completed until March. (2) The articulated, performance-based instruction guides are technical in nature and are not easy to proof. (3) Almost all articulation documents employed chart illustrations which required pages to be typed horizontally as well as vertically. The format of the illustrations and the detail completion of the charts required additional word processing time and set up. (4) Many sample test items included in the articulated, performance-based instruction guides used illustrations and required careful spacing of test items. In short, the articulation documents were massive in size, required detailed attention and proofing, required different formats from the standards utilized in the Word Processing Department, were technical in nature and had to be completed to meet tight deadlines.

Prior to preparing for revising articulation documents, this section should be reviewed so that proper time and attention may be allocated to the process of retrieving and revising documents.

AREAS ARTICULATED
(1981-1982)

Drafting I
Typewriting I and II
Shorthand I and II
Accounting I and II
Office Procedures
Business English

AREAS ARTICULATED
(1982-1983)

Auto Mechanics/Auto Mechanics Technology
Building Construction/Carpentry
Food Service-Commercial Cooking/Food Service Management
Welding (Gas, ARC, MIG, TIG)
Drafting II (Architectural, Mechanical, Structural)

POTENTIAL AREAS FOR ARTICULATION
(1983-1984)

Air Conditioning and Refrigeration
Auto Body Repair
Electricity
Machine Shop
Masonry

Figure 3

SURVEY OF PARTICIPANTS

BASIS FOR CONDUCTING SURVEY

The 1981-1982 project proposal of the Occupational Education Articulation Program indicated:

> "The task force [committee] members will be asked to complete an attitude [sic] survey about the amount of time necessary to modify the courses, the amount of modification which was required to put the course into a competency-based module, and the procedures which were used to accomplish the task.
>
> "The attitude rating [sic] will be analyzed after module is completed and given to the task force [participants] for their use in changing any procedures if needed."

A sample proposed survey included in the appendix of the project proposal was used as the basis of the survey.

SURVEY DESIGN

The design of the survey is simple and factural. A mail survey was selected because of the number of participants to be questioned and so that participants could take the time to give ample thought in answering the questions asked. The survey was presented to program participants by mail or during a meeting and participants were asked to return the completed survey form by the return envelope provided.

The design of the order of questions (question sequence) does not follow formal design technique such as funneling, starting off with general questions and progressively narrowing in scope to specific questions. It was decided to concern the survey with factual questions and some participant attitude questions concerning the articulation process or products.

In the future, more attention may be given to the technical design of the survey if the effort appears to be justified.

There has been limited pilot work in question wording and survey design due to limited project time.

Participants who do not return the mail survey will be contacted by telephone or in person and an interview survey using the mail form as a guide will be used to obtain participant responses.

This survey of task force committee participants will be employed at the end of the project year or early in the second phase or field-trial year of the project. The participants should receive completed copies of the articulated, performance-based instruction guides for review and field-trial use prior to receiving the survey.

An additional survey may be made of teachers who receive copies of the articulation guides for field-trial use but who did not participate as a member of the writing team. Responses from these teachers may provide valuable information to be considered as the articulated, performance-based instruction guides are revised after the field year.

A survey copy is included in the appendix of this Policies and Procedures Guide. Survey results will be included in revisions of the Policies and Procedures Guide, periodically.

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APPENDIXES

Appendix A	Sample Guide Pages
Appendix B	Greater Emphasis on Transfer Type Outcome-referenced (Competency) Testing Recommended
Appendix C	Survey
Appendix D	Articulation Planning Summary Chart
Appendix E	Year Three - Time Line
Appendix F	Articulation Program Continuation Plan
Appendix G	Samples of Often Used Forms to Schedule and Coordinate Task Force Committee Meetings
Appendix H	Prepared Agendas Maxamized Meeting Productivity
Appendix I	Articulated, Performance-based Instruction Guide Development Forms
Appendix J	Task Force Committee Agreement to Articulate
Appendix K	Modifying the Articulated, Performance-based Instruction Guide for Special Needs Students
Appendix L	Handling Requests for Program Documents
Appendix M	Binder Design
Appendix N	Responsibility Sheet

MODULE 4.0 SHORTHAND II

TASK 4.06 DICTATION/TRANSCRIPTION - NEW MATERIAL

PERFORMANCE OBJECTIVE:

Given dictation (1.4 Syllabic Intensity) from unpreviewed material at 70 words per minute for 2 minutes, write shorthand, using acceptable dictation techniques and, by typewriter, transcribe the shorthand notes within 30 minutes in mailable form.

PERFORMANCE ACTIONS:

4.0601 Assemble necessary supplies for dictation and transcription:

- a. Note pad
- b. Pen
- c. Typewriter
- d. Typing paper
- e. Correction devices
- f. Reference books

4.0602 Using necessary supplies for dictation, write shorthand materials as dictated.

4.0603 Review shorthand notes, inserting punctuation, correct outlines, correct spelling.

4.0604 Using necessary supplies for transcription, transcribe notes in format specified by the teacher.

4.0605 Proofread and neatly correct all errors.

SUGGESTED INSTRUCTION TIME: 30 Hours

PERFORMANCE STANDARDS:

- A minimum of 3 takes at 80 words a minute for 2 minutes is necessary to achieve competency.
- The dictated material is to be transcribed in mailable form within 30 minutes.

RELATED TECHNICAL INFORMATION:

- Mailable form standards.
- Capitalization, punctuation, grammar, and word-division rules.

UNIT 3.0 AUTOMOTIVE ENGINE MAINTENANCE, REPAIR, AND OVERHAUL

TASK 3.01 DETERMINE NEEDED ENGINE SERVICE OR REPAIR

PERFORMANCE OBJECTIVE:

Given an automobile with a possible engine problem, determine the needed engine service or repair, as accurately as possible using given and available information. Report findings to customer.

PERFORMANCE ACTIONS:

3.0101 Listen to driver's (owner's) complaint.

3.0102 Listen to engine noises, or observe performance problem.

3.0103 Inspect engine assembly for fuel, oil, collant, transmission, or other leaks.

3.0104 Check engine systems as necessary. For example, check engine exhaust smoke color and quality.

3.0105 Road test vehicle to determine needed repairs/ service.

3.0106 Determine needed repairs/service. Report to customer.

PERFORMANCE STANDARDS:

- Determine needed engine service or repair based on given and available information.
- Findings must agree with pre-diagnosed or instructor findings.

SUGGESTED INSTRUCTION TIME: 1/2 Hour

UNIT 7.0 FUNDAMENTALS OF ARCHITECTURAL DRAFTING, DRAFTING II, (Option)

TASK 7.04 INTERPRET BASIC SURVEYING OF SITE; SEARCH AND VERIFY TITLE AND DEED

PERFORMANCE OBJECTIVE:

Given instructions concerning basic surveying, method of searching title and deed, surveying equipment and instrument, additional helper for surveying; search and verify title and deed and interpret survey of site, surveying site as needed.

PERFORMANCE ACTIONS:

7.0401 Define and interpret survey terms.

7.0402 Identify surveyor's duties.

7.0403 Use surveying equipment to measure distance and angles.

7.0404 Perform a land survey of the construction site.

7.0405 Draw property lines from legal descriptions.

7.0406 Perform user maintenance and care of surveying equipment.

7.0407 Search and verify site deed.

PERFORMANCE STANDARDS:

- Perform survey tasks within accepted error limits for entry level drafter in architectural office.
- Uses and maintains equipment properly.
- Performs deed and title search as prescribed.
- Calculations 80 percent accurate.
- Demonstrates ability to use terms, definitions, and symbols with 80 percent accuracy.
- Executes drawings neatly and accurately in a professional manner.

SUGGESTED INSTRUCTION TIME: 9 Hours

RELATED TECHNICAL INFORMATION:

- Reading elevations.

SUGGESTED: Field trip to Block Book Room, County Court House

GREATER EMPHASIS ON TRANSFER TYPE OUTCOME-REFERENCED (COMPETENCY) TESTING RECOMMENDED

One discovery made during the review of textbooks, workbooks, and testbooks designed for vocational education programs was that few transfer learning tests or concept tests were included. A further discovery was that few transfer type test were developed by task force committee participants, probably because the bulk of reference material they use almost omits transfer learning or concept tests.

Workshop Guide II, "Writing Outcome-referenced Tests," introduces the concept of "transfer" learning tests; however, there is need for further in-service concerning the development of "transfer" learning or concept tests that may be used to evaluate vocational competency.

If time permits during the 1982-1983 project period, Workshop Guide II will be revised to include additional in-service information concerning the development of both retention and transfer tests.

The enclosed samples illustrate types of transfer tests that might be included in revised articulation guides for the purpose of predicting competency on the job.

OUTCOME-REFERENCED TESTS

TASK 7.29-a

You are making a resistance check on a General Motors HEI system. Look at Figure 1.

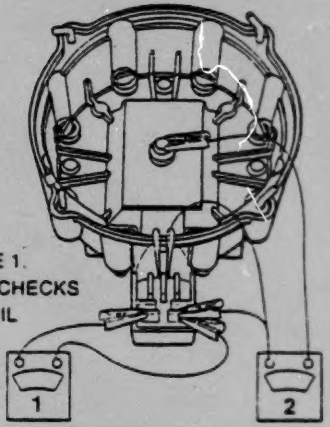


FIGURE 1. OHMMETER CHECKS OF COIL

1. Ohmmeter set up (1) reads .5 ohms. According to this reading, you should:

___ a. replace the coil
b. go to the next step, since the reading is correct
c. neither of the above
d. check your ohmmeter range setting

2. Ohmmeter set up (2) reads 20,000 ohms. According to this reading, you should:

___ a. remove coil from cap and check again
b. go to the next testing step, the reading is within an acceptable range.
c. replace the coil
d. switch ohmmeter range setting to lower range an read the scale

3. In the ohmmeter set up (2) of Figure 1., assume that the resistance reading (ohms) indicates a problem. Answer the following true-false question:

___ A bad center button or broken spring can cause an incorrect reading.

Task 7.29-b

You are continuing to make resistance checks on a G.M. HEI system. Look at Figure 2. below.

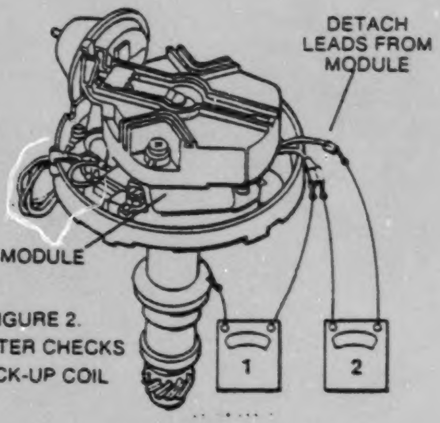


FIGURE 2.
OHMMETER CHECKS
OF PICK-UP COIL

1. You are reading the ohmmeter set up (1). Throughout the vacuum range, the ohmmeter reads infinity at all times:

___ a. you have the meter leads shorted
b. the meter leads are open somewhere
c. the resistance is incorrect, replace pick-up coil
d. resistance is correct, proceed with next step in check

2. You now are observing the ohmmeter reading in set up (2). Throughout the vacuum range, the ohmmeter reads +/- 1000 ohms at all times. Assume all preparations are correct for the test:

___ a. a reading of 500-1500 ohms is typical
b. replace the pick-up coil, the resistance is incorrect
c. a malfunction exists, the resistance should vary with throughout the vacuum range
d. replace the module, the reading should be infinity.

SURVEY

Occupational Education Articulation Program

DIRECTIONS: Kindly complete the following survey which is designed to assess your opinion concerning selected activities of the Occupational Education Articulation Program. The results of combined survey returns will be analyzed for the purpose of modifying the policies, procedures, or activities of continuing articulation activities. Please complete this survey in full and return it in the envelope provided no later than March 15, 1982.

Participant's Name ______________________________
Print

Institution/School ______________________________
Print

Position: ( ) Instructor or Other ______________________
Print

Check the curriculum guide(s) on which you worked:

( ) Drafting
( ) Typewriting
( ) Shorthand
( ) Accounting
( ) Office Procedures
( ) Business English

PART I. INTRODUCTION TO OCCUPATIONAL EDUCATION ARTICULATION PROGRAM

1. Did the "Fact Sheets," distributed to each tasks force committee participate to interpret the Occupational Education Articulation Program, familiarize you adequately with the project?

   ( ) a. did not receive "Fact Sheet" handout
   ( ) b. do not remember "Fact Sheet" handout
   ( ) c. was confused about the program
   ( ) d. the "Fact Sheet" interpreted the program to me satisfactorily

2. Did the handout, "Purposes of the Instruction Guides," distributed to task force committee participants, familiarize you with the purposes of the performance-based curriculum guides?

   ( ) a. did not receive the "Purposed of the Instruction Guide" handout
   ( ) b. do not remember the handout
   ( ) c. was confused about the purposes of the instruction guide
   ( ) d. understood the purposes of the instruction guides satisfactorily

3. Was the scope of the project clarified to you satisfactorily?

( ) a. yes
( ) b. not sure
( ) c. no

PART II. PARTICIPATION

4. When would you have been willing to participate in task force committee meetings? (check all applicable)

( ) a. directly after the end of the regular school day from
    a. ( ) 3-4 p.m.
    b. ( ) 3-5 p.m.
( ) b. evenings, say 7-9 p.m.
( ) c. Saturday morning
( ) d. Saturday afternoons

5. During the summer, when would you have preferred to meet?

( ) a. immediately after the school year ends (June), five consecutive days
( ) b. immediately before the school year begins (August), five consecutive days
( ) c. one week, five consecutive days, during the summer
( ) d. one day a month, during the summer months

PART III. WORKSHOP I (WRITING OBJECTIVES, ACTIONS, AND STANDARDS)

6. During Workshop I or in the "handout" from Workshop I, was the concept of performance-based (competency-based) instruction clarified satisfactorily to you?

( ) a. yes
( ) b. not sure
( ) c. no

7. Did the Workshop I "handout" help you in writing better performance objectives?

( ) a. yes
( ) b. no
( ) c. small amount
( ) d. a moderate amount

8. Did the workshop I "handout" help you in knowing how to better write performance actions to attain the objectives?

( ) a. yes
( ) b. no
( ) c. some

9. Did the Workshop I "handout" help you in knowing how to better write performance standards to measure attainment of the objective?

( ) a. yes
( ) b. no
( ) c. some

10. Given the limited time table of the Articulation Program, was there adequate time to understand the Workshop I "handout" prior to the beginning writing objectives?

( ) a. yes
( ) b. no

11. Rate the Workshop I "handout" as a whole.

( ) a. poor
( ) b. fair
( ) c. good
( ) d. very good
( ) e. excellent

PART IV. WORKSHOP II (WRITING OUTCOME-REFERENCED TESTS)

12. Given the time table of the Articulation Program, was there adequate time to understand the recommendations of the Workshop II "handout" prior to beginning writing tests items?

( ) a. yes
( ) b. no

13. Did the Workshop II "handout" help you better understand how to write good outcome-referenced test items?

( ) a. yes
( ) b. no

14. Rate the Workshop II "handout" as a whole.

( ) a. poor
( ) b. fair
( ) c. good
( ) d. very good
( ) e. excellent

PART V. MODIFICATION OF CURRICULUM INTO ARTICULATED, PERFORMANCE-BASED INSTRUCTION

15. Did you understand what is articulated?

( ) a. yes
( ) b. no

16. Did you understand what constitutes performance-based instruction or a performance-based module?

( ) a. yes
( ) b. no

17. Did you understand what is an outcome-referenced test?

( ) a. yes
( ) b. no

18. Did you receive a sufficient amount of information and instruction about the nature of your task (job) as a member of the task force committee?

( ) a. yes
( ) b. no

19. Was there enough time for you or your committee to complete the task?

( ) a. yes
( ) b. no

20. How was your work in the task force committee work primarily conducted?

( ) a. alone
( ) b. with one other person
( ) c. with two or more persons

PART VI. ARTICULATED, PERFORMANCE-BASED INSTRUCTION GUIDE

21. Approximately how much time did you invest in the modification of the curriculum into articulated, performance-based instruction? (Approximately)

( ) 6 hours
( ) 13 hours
( ) 18 hours
( ) 24 hours
( ) 36 hours
( ) 48 hours
( ) 72 hours
( ) more than 72 hours
( ) _____ hours

22. How much modification was necessary in order to put the course into an articulated, performance-based instruction guide or module?

( ) a. an extreme amount
( ) b. a great amount
( ) c. a moderate amount
( ) d. small amount
( ) e. no modification needed

23. In your opinion, what is the quality of the finished articulated, performance-based instruction guide or module?

( ) a. excellent
( ) b. above average
( ) c. average
( ) d. needs improvement
( ) e. poor

24. In your opinion, how adequate do you think the overall module is for preparing students in the skill area to which it relates?

( ) a. extremely adequate
( ) b. very adequate
( ) c. adequate
( ) d. fairly adequate
( ) e. not adequate at all

25. In your opinion, is the design or format of the instruction guide easy for the classroom teacher to use?

( ) a. very easy to use
( ) b. adequate (usable)
( ) c. needs improvement
( ) d. needs major revisions to be usuable

26. Which response best describes the curriculum coverage in the instruction guides?

( ) a. too little
( ) b. about right
( ) c. too much

PART VII. APPLICATION OF ARTICULATED, PERFORMANCE-BASED INSTRUCTION GUIDES

27. How well does the articulated, performance-based instruction guide relate to your instructional job?

( ) a. completely
( ) b. quite a bit
( ) c. some
( ) d. very little

28. Will you be able to use the instruction guide in your daily or weekly instructional planning or duties?

( ) a. frequently
( ) b. sometimes
( ) c. rarely
( ) d. never

29. Do you think following the instruction guides at the secondary level will result in more students continuing their career development at TEC?

- ( ) a. probably more will continue
- ( ) b. perhaps
- ( ) c. probably about the same number will continue
- ( ) d. uncertain

30. Do you plan to follow or use the instruction guide in planning daily or weekly lesson plan objectives?

- ( ) a. yes
- ( ) b. frequently
- ( ) c. sometimes
- ( ) d. rarely
- ( ) e. no

31. How often is performance-based instruction used in your instructional program?

- ( ) a. generally used
- ( ) b. frequently used
- ( ) c. moderately used
- ( ) d. seldom used
- ( ) e. never used

PART VIII. POTENTIAL PROBLEMS WITH USE OF THE GUIDE

32. Do you foresee any of the following as potential problems you may experience in using the articulated, performance-based instruction guide?

yes	no		
( )	( )	a.	too difficult to manage and use
( )	( )	b.	too difficult to keep in good condition
( )	( )	c.	needs regular revision
( )	( )	d.	expects too much from students
( )	( )	e.	expects too much from instructor
( )	( )	f.	too much trivia included
( )	( )	g.	too difficult to follow
( )	( )	h.	too little material

PART IX. OUTCOME-REFERENCE TEST

33. In using the performance-based instruction guides in your instruction, which do you think is applicable?

- ( ) a. takes time to feel comfortable using the guide
- ( ) b. requires too much preparation time
- ( ) c. instructors need training to use guide
- ( ) d. training provided on use of guides was insufficient
- ( ) e. too much pressure on instructor

34. Which best describes the recordkeeping and reporting of student proficiencies (See Proficiency Report form) in the Performance-based instruction guide?

( ) a. too much paperwork
( ) b. duplication of existing recordkeeping
( ) c. Proficiency Report form not descriptive enough
( ) d. Proficiency Report form too descriptive
( ) e. do not plan to use

35. Will you employ the outcome-referenced test samples or similar tests in your instructional program to measure competency?

( ) a. yes
( ) b. frequently
( ) c. sometimes
( ) d. seldom
( ) e. no

36. Describe the outcome-referenced test samples.

( ) a. satisfactorily
( ) b. too difficult
( ) c. not descriptive enough
( ) d. not sufficient examples
( ) e. not difficult enough
( ) f. too descriptive

PART X. RECOMMENDATIONS/COMMENTS

37. Briefly describe any recommendations or suggested changes that you have concerning the articulation process or products.

a. Initial informantion provided about project or initial project handouts.

b. Workshops (Writing objectives and writing tests).

c. Process of writing performance-based objectives, performance actions to attain the objectives, and performance standards.

d. Process of writing outcome-referenced tests.

e. The format of design of the articulated, performance-based instruction guide(s).

f. Task force committee meeting time that was scheduled.

g. Task force committee meeting locations or working areas that were used.

h. Materials provided (such as sample articulation or performance-based curriculum guides, texts, etc.) by the Articulation Program to help the task force committees write the instruction guides.

i. Other recommendations or comments.

DEADLINE FOR RETURN OF SURVEY

March 15, 1982, is the official deadline for return of this survey. If you are unable to return the survey by the deadline date, please return it as soon as possible. To obtain an adequate response to the questions, a telephone or personal interview will be conducted with those participants not returning the survey.

Remember, mail the survey in the attached addressed envelope no later than March 15, 1982.

Thank you for your contribution.

S-1-82

1981-1982 SURVEY RESPONSES (NARRIATIVE)
BUSINESS AND OFFICE EDUCATION

Selected Teacher Participant's Response	Program Response to Survey Response to Assist Future Articulation
(all) "Business and office education teachers did not know about project" (referring to non-task force committee participants)	It was not practical to have all 45 secondary Business and Office Education teachers participating in task force committee meetings; however, a representative from each school was elected to participate. All teachers received program orientation information and updates as well as "how-to-implement" articulation information.
"A lot of unnecessary work."	All program "fact sheets" stressed the importance of understanding the necessity of developing performance-based descriptions for lateral articulation, standardization, and as a basis for vertical articulation.
"It is basically what I attempt to do already."	Program information emphasized that experienced teachers probably would be following the same direction described in the articulated curriculum guides since the goals are to ensure that graduates are qualified to meet minimum entry level employment standards or possess the skills and knowledges necessary to successfully continue career development at the post-secondary level where they should receive some advanced placement based on a demonstrated competency.
"It is a difficult task." (...to develop performance-based instruction.)	As stated in program "fact sheets": "To develop quality performance-based instruction material takes time and lots of hardwork, including analyzing the product and rewriting it to accomplish the objectives for the given students, teachers, instructional environment, potential employers, etc."

"Too much time between meetings." (...of task force committee.)	With the given project staff, it was not feasible to further condense the curriculum development process which from in-service to guide distribution was accomplished in 12 months. The instructor guide development time was nine months.
"Guide is similar to Clemson or State Department of Education provided material."	Many existing curriculum materials were identified to be out-of-date with current employer needs of existing materials were integrated into the articulated curriculum guides as well as were unpublished objectives under development by the State Department of Education. The articulated instruction guides are not duplicates of any other materials: They represent the local vocational program(s) and the minimum task objectives to prepare graduates for successful entry level employment.
"I feel that these (guides) will not be used...by TEC or high schools...placement tests at TEC will be given anyway..."	The Occupational Education Articulation Program pointed out that although "Proficiency Reports" would be used to report competencies developed in the performance-based secondary vocational programs, TEC placement tests would continue to be needed until the articulation process, especially outcome-referenced testing, was validated. TEC placement tests allow for placement of a student at the student's level of proficiency...and currently is an efficient method of operation.
"Fine"	
"A lot of help..."	
"Well pleased with our work..."	
"This seems to be a good curriculum guide..."	
"We have wanted a curriculum guide for years! Thank you!"	

"It is an outline of my classroom objectives..."

"Satisfactory"

"Design...is...adequate."

Teacher responses to the articulation program and activities basically were standard. Most teachers welcomed the curriculum development opportunity and most probably will make use of the final products. Most teachers, as a benefit from their articulation program activities, probably will emerge as better instructional planners.

Business and Office Education secondary teachers comprised a group of 45 persons, some full time vocational teachers and others teaching only one or two courses in the business field. Because only a representative group (18 persons) could be assembled to develop the curriculum guides for Business and Office Education, some teachers, regardless of project staff efforts to inform them, were not fully cognizant of how they were to use the project documents. Improved public information concerning the project, primarily at the secondary level, probably would have helped inform teachers how they were to participate in the articulation program.

These survey responses are included to assist future articulation activities minimize inhibitors.

ARTICULATION PLANNING
SUMMARY CHART

Occupational Education Articulation Program
August, 1982

Vocational Programs	Donaldson Voc. Cen.	Enoree Voc. Cen.	Foothills Voc. Cen.	Golden Strip Voc. Cen.	Greenville TEC	Completed	Current Project	Remaining	Not Recommended	Recommended for 83-84
Air Conditioning and Refrigeration	x	x	x	x	x			x		yes
Auto Body Repair		x		x	x					yes
Auto Mechanics	x	x	x	x	x		x			
Building Construction	x	x	x	x	x		x			
Cosmetology	x	x	x	x					x	
Drafting	x	x	x	x	x	x				
Electricity	x	x	x	x	x					yes
Food Service	x		x	x	x		x			
Graphics Communication	x	x								
Health Occupations	x	x		x	x				x	
Industrial Maintenance Mechanic	x				x			x		
Machine Shop	x	x	x		x					yes
Masonry	x	x	x	x	x					yes
Office Occupations	x		x		x	x				
Plumbing and Pipefitting		x	x	x						
Sheet Metal	x		x	x					x	
Small Engine Repair				x					x	
Tailoring		x							x	
Textiles		x			x				x	
Tile Setting	x								x	
Welding	x		x		x		x			

YEAR THREE - TIME LINE

	PHASE III (1st Year of Operation) "Development Phase"	PHASE II (2nd Year of Operation) "Field Trial Implementation"	PHASE I (3rd Year of Operation) "Full Implementation of Revised Guides"
Programs	Air Conditioning & Refrigeration Electricity Masonry Machine Shop Auto Body Repair	Automotive Mechanics Carpentry Drafting II Food Service Welding	Typewriting I and II Shorthand I and II Accounting I and II Office Procedures Business English Drafting I
March 1, 1983	Extension of 2nd Year of Occupational Education Articulation Program.	Continue development of Phase II Automotive Mechanics and Carpentry.	Continue field trial testing of Phase I programs.
	Phase III initiated.	Continue "early" implementation of Food Service, Welding, and Drafting II guides.	
		Extension of 1982-1983	
1982-1983 Extension March - June	Organize task force committees to articulate Phase III vocational education programs. Acquire necessary reference materials for task force committees to use in developing articulated, performance-based instruction guides.	Complete articulation of Phase II programs and prepare for implementation during Year Three as appropriate, NOTE: Automotive Mechanics will require additional time to develop and will extend into Year Three for development.	Complete field trial testing of Phase I program guides. Revise Phase I guides, correct Word Processing magnetic file copy, and issue revised guide pages or guides to Phase I participants for full implementation of articulation guides by Fall, 1983.

Phase II postponed to July, 1983, due to loss of federal funding.

Phase III postponed to July, 1983, due to loss of federal funding.	Coordinate and conduct task force committee Workshop I Writing Performance Objectives, Actions, and Standards. Coordinate task force committee meetings to write program descriptions, task objectives, performance actions, and standards.	Continue "early" implementation of Food Service, Welding, and Drafting II objectives, actions, and standards. Continue development of test samples for early implementation programs. Collect "early" field trial data and revise Food Service, Welding, and Drafting II guides for tentative full implementation by Fall, 1983. NOTE: This will be 12 months ahead of previous schedule. As appropriate, complete guide preparation and distribution of Phase II articulation guides.	
	Fiscal 1983-1984		
First Quarter July - September 1983	Task force committees meet during July, August, and September to develop program descriptions, task listings, task objectives, task actions, and minimum performance standards.	Revise as necessary Phase II guides for Fall, 1983, field trial or implementation. (If extensive revisions are not involved and "early" field trial data is favorable, Food Service,	Reproduce and distribute by August any revisions to Phase I guides. First year of full implementation of Phase I articulation guides begins in August.

	1st Quarter Status Report submitted by September 30.	Welding, and Drafting II will be implemented by Fall, 1983, ahead of schedule.) Reproduce and prepare applicable Phase II guides for distribution in August. Continue development of Automotive Mechanics as necessary to complete the guide during 1983.	
Second Quarter October - November 1983	Organization and conduct of Workshop II, Writing Outcome-referenced Tests. Continue development of Phase III program objectives, task actions, minimum standards, and initiate writing outcome-referenced tests. 2nd Quarter Status Report submitted by December 20.	Field trial Phase II guides that have not been field tested.	Monitor continuation of Phase I articulation.
Third Quarter January - March 1984	Continue development of Phase III program guides. Begin submitting drafts to Word Processing for magnetic filing and final typing.	Monitor field trial implementation of Phase II articulation programs. Continue development of Automotive Mechanics as necessary.	Monitor continuation of Phase I articulation. Follow up GTC students who have exempted an articulated program to determine validity of advanced placement procedures.

	Preplan and make preparations to continue articulation program for 1984-1985. 3rd Quarter Status Report submitted by March 31.		
Fourth Quarter April - June 1984	As necessary continue the development of any unfinished program guides. Prepare Phase III articulated guides for Fall, 1984, field trial. End of project year Status Report, 4th Quarter, submitted by June 30.	Revise Phase II articulation guides based on field trial data. Distribute revisions for Fall, 1984. Prepare Automotive Mechanics for distribution and implementation by Fall, 1984.	Revise Phase I articulation guides as necessary. Distribute revisions for Fall, 1984.

IMPLEMENTATION PROCESS TO ARTICULATE "ONE" VOCATIONAL PROGRAM

1st Year	2nd Year	3rd Year	4th Year
Development	Field Trial Implementation	Full Implementation of Revised Guides	Continuation
Task force committee organized. Articulated, performance-based instruction guide developed with outcome-referenced tests. **NOTE**: Depending on the vocational program and the skills of the task force committee participants in competency-based curriculum development, it may be possible to complete the articulation guide to a stage which will allow "early" implementation during the first year or it may require a two year period to develop an articulation guide.	Using the articulated, performance-based instruction guide developed during first year; implement articulation. Field trial articulated instruction guide. Revise guide based upon field trial results. Initiate collecting data for future validity and reliability study. Articulated, performance-based instruction guide is reviewed by vocational program advisory committees in each vocational center or high school as appropriate.	Continue articulation with revised articulated, performance-based instruction guide. Collect data from advanced placement students and others for validity and reliability study.	Continue articulation repeating process of revising articulation guide task objectives, task actions, and standards based on validity and reliability study, on programs being conducted at secondary and post-secondary levels, and based on what employers state they desire in prospective employers. (1st year of fully revised guides.)
Guide development.	1st year guide implemented at secondary level.	1st year a secondary graduate experiences post-secondary training.	1st year a two year secondary program graduate experiences post-secondary training.

SCHEDULE OF TASK FORCE COMMITTEE MEETINGS
Year Three
Occupational Education Articulation Program

E-6

		PARTICIPANTS SECONDARY	GTC	Total	March, June, 83				Fiscal 1983-1984											
					M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J
PHASE III																				
Air Conditioning & Refrigeration		4	1	5	R	R	R	P	P	P	R	R	R		R	R	R	R		
Auto Body Repair		2	1	3	R	R	R	P	P	P	R	R	R		R	R	R	R		
Electricity		4	1	5	R	R	R	P	P	P	R	R	R		R	R	R	R		
Machine Shop	**	3	1	4	R	R	R	P	P	P	R	R	R		R	R	R	R		
Masonry		4	1	5	R	R	R	P	P	P	R	R	R		R	R	R	R		
Total		17																		
PHASE II																				
Automotive Mechanics		4	1	5	R	R	R				R		R		R		R		R	
Carpentry		4	1	5	R	R	R												R	
Drafting II	*	4	1	5			R												R	
Food Service		3	1	4			R												R	
Welding		2	1	3			R												R	
Total		17																		
PHASE I																				
Typewriting I & II	*	4	1	5			R												R	
Shorthand I & II	*	2	1	3			R												R	
Accounting I & II	*	6	2	8			R												R	
Office Procedures	*	2	1	3			R												R	
Business English	*	2	1	3			R												R	
Drafting I	*	4	1	5			R												R	
Total		20																		

*Meetings may be combined (e.g., Drafting I and Drafting II)
**Development of articulated guide may require two years.

CODES:
R = Release Time
P = Purchased Time

ARTICULATION PROGRAM CONTINUATION PLAN

PREPARATION FOR CONTINUATION

From the start of the Occupational Education Articulation Program, it was clear that the articulation project would be for a limited period of time due to federal funding. The basic objective was to development and implement a system for articulating similar vocational education programs of The School District of Greenville County and Greenville Technical College.

During the initial year of the articulation program, a first draft of a Policies and Procedures Guide for Articulation was developed. The Guide now has been revised and is a usable product to guide articulation at the institutional, school, or classroom level. The Guide has been designed to be easily modified and can be employed with a minimum of supervision at the institutional level. It is recommended for use by school or department level supervisors who are the principal curriculum leaders.

It was clear that guidance and career counseling personnel of the participating institutions must be involved in the articulation process to counsel students concerning advanced placement opportunities. For this reason, a Counselor's Guide to Articulation was developed and provided to all senior high school, vocational career centers counselors, and career center placement coordinators in The School District of Greenville County. Admissions and recruitment personnel at Greenville Technical College were provided with the Counselor's Guide to Articulation also. As an appendix to the Counselor's Guide, a description of all articulated vocational education programs was included in a publication titled, Syllabuses of Articulated Vocational Education Programs.

The Syllabuses of Articulated Vocational Education Programs provides a concise description of the secondary vocational education program and similar post-secondary courses.

Vocational education programs that were articulated during the first year of the articulation project included Drafting I, Typewriting I and II, Shorthand I and II, Accounting I and II, Business English, and Office Procedures. During the second year of the articulation project, the field-trial editions of the guides were revised and page revisions issued to all program participants. Phase I guides have been revised for the second year of field-trial. The guides are being followed at the secondary level and may be used by the post-secondary level to test competencies of secondary graduates. The outcome-referenced tests in the Phase I guides have not been validated due to a lack of project time and the limited staff of the project.

During the second year of the project, Phase II, articulated, performance-based instruction guides were developed for Automotive Mechanics, Carpentry (Building Construction), Food Service, Welding, and Drafting II (Architectural, Mechanical, and Structural options). Some early field trials and revision of these documents was accomplisted during the development period. The Mechanical Drafting option of Drafting II probably needs further review and development to reflect a more standardized, generic approach.

At the direction of the Executive Committee, Occupational Education Articulation Program, Phase III of the program which was to concentrate on the vocational programs of Air Conditioning and Refrigeration, Auto Body Repair, Electricity, Machine Shop/Technology, and Masonry was postponed until July, 1983, because there was the possibility that budget restrictions might limit program funding. Previously, a "phased development" process was used to initate the development of the next phase of the program prior to completing the previous phase. By April, 1983, the articulation program was notified that the loss of federal funding would result in the termination of the full time articulation program coordinator and secretary.

Subsequent to the end of Phase II of the articulation program, some basic textbooks and workbooks were purchased to aid the development of articulated, performance-based instruction guides for Phase III of the articulation program. These publications, when supplemented by a few additional materials will provide the necessary materials from which Phase III articulated, performance-based instruction guides may be developed.

Every activity and document of the articulation program has been developed based on the promise that articulation would be continued in some form even if a full time staff was not assigned to coordinate the program. The Policies and Procedures Guide for Articulation was developed and revised to provide a direction for the continuation of successful articulation between The School District of Greenville County and Greenville Technical College. Existing activities of both institutions have been identified to support articulation and much of the responsibility for articulation has been assigned to vocational instructor "articulation task force committee participants."

RESPONSIBILITIES FOR CONTINUATION OF ARTICULATION

Continuation of the articulation process already established will require a minimum of supervision, preferably at the vocational/career center and post-secondary department head levels. Minor coordination at the School District and Greenville Technical College administrative levels should ensure that the articulation program is continuing to fulfill its goals: It is recommended that staff coordination continue to be a joint responsibility of the District's vocational consultant and GTC's Vice President for Instruction.

RECOMMENDATIONS FOR PHASE III DEVELOPMENT

1. Review Policies and Procedures Guide for Articulation.
2. Scan several previously developed articulated, performance-based instruction guides. The Automotive Mechanics, Food Service, and Carpentry guides are possible examples.

3. Review in detail Workshop Guide I, "Writing Objectives, Actions, and Standards," and Workshop Guide II, "Writing Outcome-referenced Tests." Tese publications were developed to do the following:
   a. Provide a complete guide to aid a coordinator in conducting an in-service training for task force committee participants.
   b. A major section of the guides is a "how-to-do-it handout" for task force committee participants. Task force committee participants will need the "how-to-do-it" handout section for reference, some worksheet forms to guide their initial development work, and should be introduced to a "sample guide" so they will have a clear concept of the type of product they are developing.
4. Review slide presentation concerning "Performance-based Instruction - A Process of Articulation." This presentation should be used to orient the task force committee participants concerning the overall job they are undertaking.
5. Organize the Task Force Committee.
6. Schedule one meeting a month for the necessary period of time to develop the performance-based curriculum description (secondary) that will be the basis for articulation.
7. Follow the "Schematic of Articulated, Performance-based Instruction Guide Development Process" and the "Simplified Steps of the Development of Articulated, Performance-based Instruction Guides" which are included in the Policies and Procedures Guide.
8. Schedule meetings to establish definite objectives by deadlines using the charts mentioned in item 7 above.
9. A development process, without a full time writer, should be scheduled for a two year period. Some programs (Welding is an example) may be developed in less time.
10. As much as practical, drafts should be routed through Word Processing for storage and easy editing/correction at a later date. Task force committees should be able to review the material they have developed periodically and a file at Word Processing will protect the work accomplished should something happen to working copies.

SAMPLES OF OFTEN USED FORMS TO SCHEDULE AND COORDINATE TASK FORCE COMMITTEE MEETINGS

Many communications-forms were devised to assist the Occupational Education Articulation Program accomplish its objectives on time. The areas of scheduling and coordinating task force committee meetings required efficient coordination that was achieved through the use of communications-forms represented by the attached samples.

Forms were used to sample task force committee participants concerning the best times to schedule meetings. Other forms were used to notify task force committee participants, principals, vocational career center directors and others of meetings.

Another form was used to register task force committee participants so they might receive credit for their participation or, if the meeting were scheduled for non-school hours, so they might be paid for their participation. In addition, registration forms provided a record of the number of hours required to develop articulated, performance-based instruction guides.

SURVEY

(1982-1983 Task Force Committee Participants)
Occupational Education Articulation Program

On March 1, 1982, the Occupational Education Articulation Programs begins Phase Two, the articulation of the following areas:

- Auto Mechanics/Automotive Mechanics
- Building Construction/Carpentry
- Food Service/Commercial Cooking/Food Service Management
- Welding
- Drafting II (Architectural, Mechanical, and Structural)

To accomplish the objective of writing of articulated, performance-based instruction guides for the above areas, "task force committees" will meet periodically from March, 1982, to December, 1982, to draft the curriculum guides.

The "task force committee" meetings will be a combination of:

(a) Release time from classroom responsibilities (Occupational Education Articulation Programs pays for your substitute)

(b) On your own time for which you will be paid a stipend

WE NEED TO SCHEDULE MEETING TIMES WHICH WILL BE CONVENIENT TO THE GREATEST NUMBER OF TASK FORCE COMMITTEE PARTICIPANTS!

DIRECTIONS:

KINDLY COMPLETE THE FOLLOWING SURVEY. RETURN IT IN THE ENVELOPE PROVIDED NO LATER THAN MARCH 15, 1982.

1. If released from classroom duties during the regular school week to participate in task force committee meetings (substitute paid by Program), which is the best day (in the week) for you to attend the committee meeting?

   ( ) Mon. ( ) Tue. ( ) Thur. ( ) Fri.

2. During the school year but after the school work day (on your own time), when would you be willing to participate in task force committee meetings (to be paid for participation)?

   (Check all applicable.)

   ( ) directly after end of regular school day from...

   ( ) 3-4 p.m. ( ) 3-5 p.m.

DATE: ____________________

TO: Vocational Center Directors

RE: INFORMATION NOTICE
TASK FORCE COMMITTEE MEETING
INVOLVING INSTRUCTOR FROM YOUR SCHOOL

____________________ ( ) Automotive Mechanics
____________________ ( ) Building Construction/Carpentry
____________________ ( ) Food Service
____________________ ( ) Welding
____________________ ( ) Drafting II

TIME: 8:30 a.m. to 3:30 p.m.

A SUBSTITUTE FOR THIS TEACHER WILL BE REQUIRED.

RELEASE TIME ACCOUNT NUMBER

#2202-115-120.91

The committee meeting/working session will be held at the District Office or at Donaldson Vocational Center. In case of emergencies, telephone 277-3656.

We have asked instructor participants to coordinate with the principal/director concerning the substitute and to ensure the principal/director receives the Release Time Account Number.

Thank you for your support to this Program.

Sincerely,

Ed Henderson Jr.

Ed Henderson Jr., Coordinator
Occupational Education Articulation Program

EH/tae

The School District of Greenville County
Box 2848-301 Camperdown Way · Greenville, South Carolina · 29602 · 803/242-6450

DATE: ______________________________

TO: TASK FORCE COMMITTEE MEMBERS
Occupational Education Articulation Program
( ) Automotive Mechanics
( ) Building Construction/Carpentry
( ) Food Service
( ) Welding
( ) Drafting

WHAT: NOTICE OF
ARTICULATION TASK FORCE COMMITTEE MEETING

WHEN: Date: ________________________
Day: ________________________
Starting at 8:30 a.m.
Ending at 3:30 p.m.

WHERE: ____
____
____

PURPOSE: Complete writing performance objectives, actions, steps, or skills necessary to accomplish the objectives minimum performance standards, and outcome-referenced tests.

LUNCH BREAK: 11:30 a.m. - 12:30 p.m. (1 hour)
Lunch is on your own
Afternoon session begins promptly at 12:30 p.m.

SCHOOL DAY MEETING: For secondary level participants, this school day meeting is classified as "release time" from instruction.

Please be sure your secondary vocational center director has this...

RELEASE TIME ACCOUNT NUMBER
#2202-115-120.91

PLEASE BRING: Draft articulated, performance-based instruction guide. Pen or pencil. Any references, instructional guides, textbook, etc., that may be of help.

Please remember to sign in when you arrive so that we can maintain a record of the manhours involved to develop the articulation guides.

Sincerely,

Ed Henderson Jr.

Ed Henderson Jr., Coordinator
Occupational Education Articulation Program

EH/tae

The School District of Greenville County
Box 2848-301 Camperdown Way · Greenville, South Carolina · 29602 · 803/242-6450

DATE: ____________________________

REGISTRATION FORM
TASK FORCE COMMITTEE MEETING
OCCUPATIONAL EDUCATION ARTICULATION PROGRAM

( ) Automotive Mechanics
( ) Building Construction/Carpentry
( ) Drafting
( ) Food Service
( ) Welding
( ) Business and Office Education

( ) Release Time Account # 2202-115-120.91

( ) Stipend Account # 3202-115-321.95

NOTE: Release time is for participation during regular school hours.

Stipend time is for participation during non-school hours (e.g., during the summer).

Center, HS, TEC	Participant's Name	Social Security No. for Stipend Payment	Address where you wish to receive Stipend check by mail	Hrs.
Donaldson Voc. Center				
Enoree Voc. Center				
Foothills Voc. Center				
Golden Strip Voc. Center				
Greenville TEC				

PREPARED AGENDAS
MAXIMIZED MEETING PRODUCTIVITY

Prepared "agendas" for task force committee meetings helped ensure that the maximum production resulted from the teacher working sessions. A sample "agenda" is enclosed.

Enclosed also is a sample "agenda" used with one meeting of the Executive Committee, Occupational Education Articulation Program.

BUSINESS AND OFFICE EDUCATION
TASK FORCE COMMITTEE
OCCUPATIONAL EDUCATION ARTICULATION PROGRAM
of the
The School District of Greenville County
and
Greenville Technical College

MEETING AGENDA
Tuesday, February 22, 1983
8:30 a.m. - 3:30 p.m.

Instructional Service Conference Room, Lower Level Administrative Office, The School District of Greenville County

The primary purposes of the Task Force Committee meeting are:

1. To provide an opportunity for Business and Office Education/ Secretarial Science Task Force Committee members to jointly meet to discuss field trial findings and share ideas concerning the Articulated, Performance-based Instruction Guides and Articulation Program.

2. To review and revise individual articulation guides to include:

   - Program description
   - Course objectives or task lists
   - Performance actions to accomplish objectives
   - Minimum performance standards
   - Suggested instruction times
   - Outcome-referenced tests
   - Proficiency reporting form and procedure

3. To correct English, typo, or technical errors in field trial editions of articulation guides.

4. To make suggestions to be incorporated into the revised Policies and Procedures Guide for Articulation so that articulation may be continued in an efficient and effective manner.

PLANNED AGENDA

8:30	Meeting begins
8:30 - 9:00	Review of articulation program design, purposes of articulation program and guides, tasks of committee, and agenda of meeting. Committee organizes into curriculum teams.
9:00 - 10:00	Comments from GTC representative (may be scheduled for later during meeting). Discussion of potential inhibitors to articulation.
10:00 - 11:30	Curriculum teams discuss field trial findings.
11:30 - 12:30	Lunch, on your own (or bring your own)
12:30	Meeting resumes
12:30 - 1:30	Summarize curriculum team findings in written form *(Members may switch teams for input)
1:30 - 3:00	Discuss articulated findings to revise guides and articulation program procedures for 1983-1984.
3:00 - 3:30	Recommendations for planning annual follow-up and future articulation meetings by Business and Office Education/Secretarial Science Task Force Committee.
3:30	Adjournment

EXECUTIVE COMMITTEE
OCCUPATIONAL EDUCATION ARTICULATION PROGRAM
of
The School District of Greenville County
and
Greenville Technical College

MEETING AGENDA

Wednesday, February 23, 1983
10:00 a.m.

10:00 a.m. Call to order by Chairman Chastain

Status of Phase Two Program Development

Status of Phase One Program Field Trial

Fourth Quarter major program activities

Recommendation to Implement "Proficiency Reporting" of minimum occupational competencies at secondary level.

Program strengths

Program inhibitors to articulation

Recommendations for improved articulation:
- Secondary
- Post-secondary
- Articulation Program

Plans for "Program Extention" period, March 1 - June 30.

Status of Occupational Education Articulation Program continuation.

11:00 Adjournment

TASK FORCE COMMITTEE
ARTICULATED, PERFORMANCE-BASED INSTRUCTION GUIDE
DEVELOPMENT FORMS

Development of the articulated, performance-based instruction guides followed a standardized format which proved most successful and efficient.

The enclosed forms outline the information that was necessary to develop the guides. The most used, fourth form, speeded the description of task objectives, performance actions, and performance standards.

PERFORMANCE OBJECTIVE WORKSHEET, PAGE NO. ___

MODULE .0 TITLE ______________________

TASK .___ TITLE ______________________

PERFORMANCE OBJECTIVE: (Include given conditions, behavior desired, and standards to determine competency)

PERFORMANCE ACTIONS: (Actions, steps, etc., to reach objective)

PERFORMANCE STANDARDS: (Statement or statements of expected performance standards to determine competency)

SUGGESTED INSTRUCTION TIME: ___ Hours

RELATED TECHNICAL INFORMATION: (Information student should know to accomplish objective or helpful or reference information)

CHECKLIST FOR OBJECTIVE OR PERFORMANCE ACTIONS (If applicable):

Module No. ______ Title ______________________________

GIVEN INFORMATION

Necessary machines, tools, equipment, training aids:

Materials, products, subject matter, services:

Requirements/limitations on student (Worker):

Related technical information the worker (student) must know to be able to perform the task:

Instructional texts or references:

Module No. ____________ Title ________________________________

ENVIRONMENTAL CONDITIONS

1. Environmental: Inside _____%
Outside _____%

Teamwork _____%
Proximity _____%
Isolation _____%

2. Extreme cold with or without temperature changes

3. Extreme heat with or without temperature changes

4. Wet or humid

5. Noise

6. Vibration

7. Hazards: Mechanical
Electrical
Burns
Explosives
Radiant Energy
Other

8. Atmospheric conditions: Fumes
Odors
Dusts
Mists
Gases
Poor Ventilation
Other

PHYSICAL DEMANDS

1. Strength, lifting, carrying, pushing, or pulling: Sedentary work
Light work
Medium work
Heavy work
Very heavy work

2. Climbing or balancing

3. Stooping, kneeling, crouching, or crawling

4. Reaching, handling, fingering, or feeling

5. Talking or hearing

6. Seeing

TASK LISTING

for ______________

The Task Listing is a statement of each major task or Objective to be performed by the worker (or student) in the job areas (course of training).

For example: In Automotive Mechanics, a module of study might include Engine Tune-Up. Within that module, the worker might be expected to "Perform minor tune-up..." That is the objective. To accomplish that objectives will require going through a sequence of steps such as servicing/replacing spark plugs, replacing ignition points and condenser, etc.

The objective statement should include given information, the conditions under which the worker (student) will perform, the performance expected, and the standards for measuring competency (accomplishment of the job).

No. Performance Objective Statement (1-2 sentences preferred)	Frequency that average worker will be required to perform task				Level of difficulty: Normally performed skill level or levels checked			
	Daily	Weekly	Monthly	Periodically	Easy	Moderate	Difficult	Very difficult

Module No. ______ Title ______________________________

MODULE STANDARDS

(Standards that are in effect for the entire module and that are not optional. Standards applicable only to a particular set of tasks or functions should be described on the Performance Standards page.)

TASK FORCE COMMITTEE
AGREEMENT TO ARTICULATE

A formal agreement indicating support of the concept of articulation and the articulation program was signed by the administrative heads of the participating institutions. This agreement was underscored at the instructional level of articulation through an agreement to articulated among task force committee participants.

The purpose of the instructional level articulation agreement is to contribute to the articulation program in the following ways:

- The responsibility to articulate cannot be interpreted as forced on instructors: Articulation becomes a mutual agreement among instructors.
- It becomes the instructor's responsibility to follow the articulation guide and agreement.
- The instructor becomes responsible for notifying and obtaining mutual agreement among task force committee counterparts if his/her vocational program does not conform to the articulated guide.
- Instructor task force committee participants become responsible for periodic review of the objectives and standards of the articulated, performance-based instruction guides to ensure that articulated vocational education programs in Greenville County are efficiently and effectively serving the community and students.
- In short, the instructors agree to mutually make articulation work.

TASK FORCE COMMITTEE
AGREEMENT TO ARTICULATE
VOCATIONAL EDUCATION

Articulation provides a system whereby secondary and post-secondary instructors can cooperate effectively in providing a continuous occupational development program where the level and type of vocational training that leads to entry-level employment skills will be clear to instructors, other educators, students, and potential employers.

The concept of articulation and the articulation program are supported fully be The School District of Greenville County and Greenville Technical College which have agreed upon a statement of purpose for the articulation of similar vocational education programs in Greenville County.

The articulation program in Greenville County is a joint effort of The School District of Greenville County and Greenville Technical College to develop a continuous program of vocational training so that students may continue their career preparation without loss of time or waste of effort in repeating tasks which have been learned previously and demonstrated. Articulation program activities are designed to help remove unnecessary gaps or overlap in student learning which may occur when a student completes a secondary vocational program and continues career development at the post-secondary level in a similar occupational field.

To implement articulation, instructor representatives from the participating institutions have met as a task force committee to develop this articulated, performance-based instruction guide which describes the secondary vocational program and which provides the parameters for vertical articulation.

Vertical articulation shall include recognition of the occupational competencies demonstrated by secondary graduates of articulated vocational programs.

It is agreed that...

The task force committee instructor representatives from The School District of Greenville County and Greenville Technical College mutually recognize the value of occupational education provided by each institution.

The task force committee instructor representatives will take the necessary actions, approved by their administrations, to ensure that this agreement to articulate is fulfilled including interpreting the program to students.

It is understood that periodic review of the articulated task objectives, performance actions, minimum standards, and outcome-referenced measures will be necessary to ensure that a valid training program is serving the needs of the community and the students.

Each task force committee participant hereby agrees to notify the others of any changes which modify the articulated, performance-based vocational program described in this guide so that each articulation guide, and where appropriate the articulation program, may be revised mutually so that articulated occupational training in Greenville County will conform to the minimum standards outlined in this guide.

This agreement to articulate establishes the necessary framework for lateral as well as vertical articulation.

AGREED UPON BY THE TASK FORCE COMMITTEE PARTICIPANTS ON THIS DAY,

____
date

Name Institution/School

MODIFYING THE ARTICULATED, PERFORMANCE-BASED INSTRUCTION GUIDE FOR SPECIAL NEEDS STUDENTS

The Articulated, Performance-based Instruction Guide for Food Service contains a sufficient variety and cluster of tasks from which to design a secondary training program to provide employable skills to special needs students.

For the special needs student, such as the mentally handicapped, units from the food service curriculum guide may be selected and emphasized to form the core of a modified training program. If possible, avoid any lowering of the minimum standards (competency level) recommended by the food service industry as important to success in entry level employment.

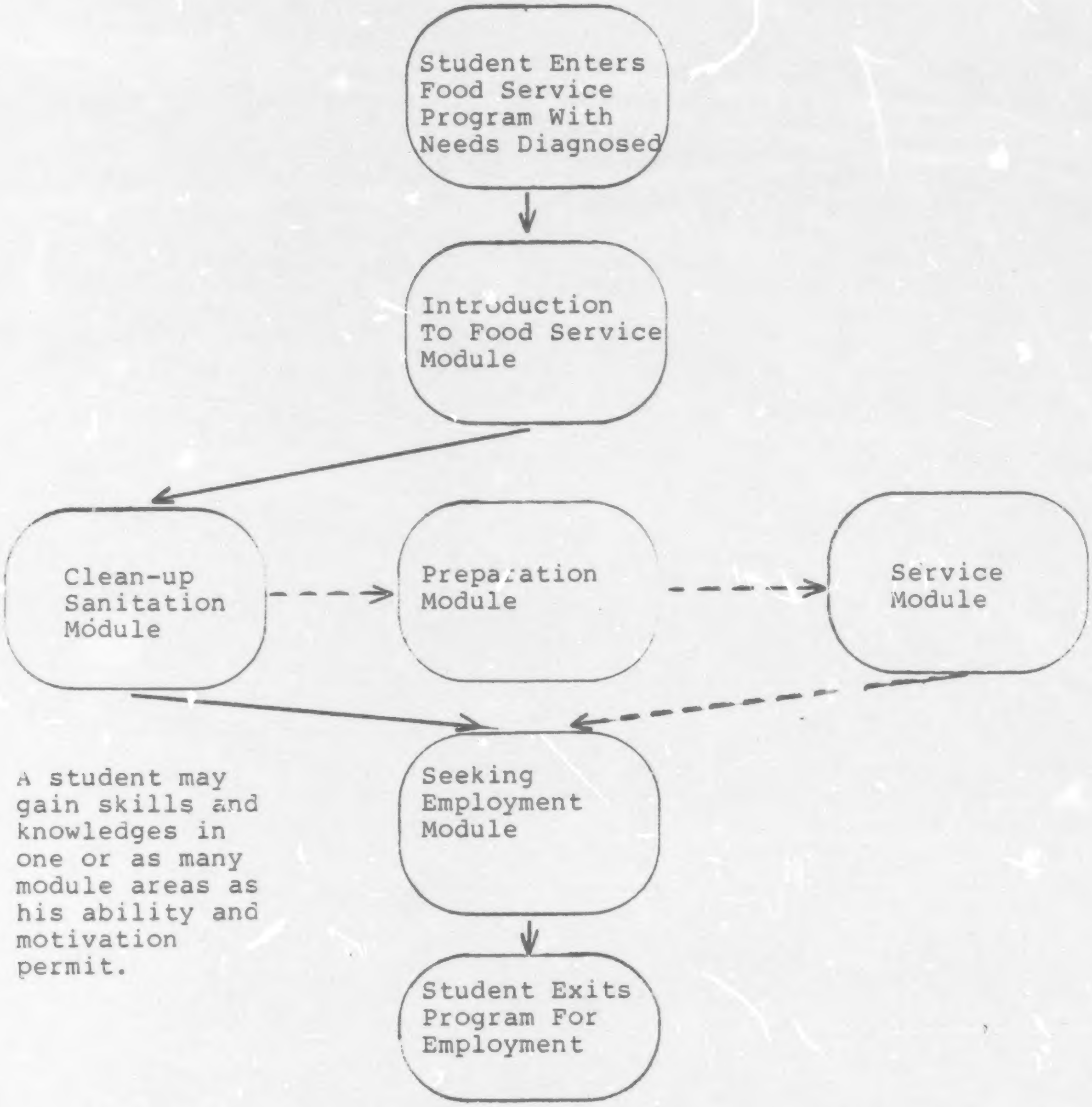
A modified secondary level curriculum based on the Articulated, Performance-based Instruction Guide to Food Service may be designed to prepare the student for the following career options:

1. Initial employment in food service work in such jobs as:
   - porter
   - dishwasher
   - bus boy/girl
   - waiter/waitress
   - counter helper
   - short order cook trainee
   - apprentice cook
2. Continuation of food service training at Greenville Technical College in the evening continuing education, certification, or Associate Degree programs.

Recommendation: A student who has developed competency in at least one task cluster (such as waiter/waitress or dishwasher) at the proficiency level (see standards) recommended by the food service industry probably will be better qualified for entry level employment than a student who only has been introduced to several task clusters or the entire secondary food service program and who has attained no competency level.

On the following page is a brief outline of some suggested food service units which may be used as a core curriculum to prepare special needs students for successful entry level employment. (See next page.)

SERVING THE SPECIAL NEEDS OF ALL STUDENTS


Student Enters Food Service Program With Needs Diagnosed
Introduction To Food Service Module
Clean-up Sanitation Module
Preparation Module
Service Module
Seeking Employment Module
Student Exits Program For Employment

A student may gain skills and knowledges in one or as many module areas as his ability and motivation permit.

Schematic illustration to represent how a special needs student may enter Food Service, or other vocational programs, and process through one or more modules to gain employable skills. In effect, a student entering an articulated, performance-based vocational program is guaranteed the opportunity to exist the program with employable skills depending upon his individual motivation and ability.

While some modules are designed to serve the handicapped student, other modules are designed to service the student who excells.

SOME SUGGESTED UNITS FOR SPECIAL NEEDS STUDENTS

NOTE: Training tasks should be chosen based on an assessment of the student's needs.

INTRODUCTION

- Orientation to food service
- Personal characteristics for success in food service
- Safety in food service
- Sanitation and personal hygiene

CLEAN UP/SANITATION

- Sanitation
- Clean and maintain food preparation/service equipment
- Maintain clean and sanitary food preparation/service/storage area
- Wash dishes/pots/pams/utensils
- Use/care of food service equipment
- Use/care of food service utensils
- Career opportunities in food service:
  - Perform bus service duties
  - Perform various job in food service
- Ordering, receiving, inventorying
  - Inspect incoming food and beverages for quality and freshness
  - Store equipment and supplies as needed in assigned areas

PREPARATION

- Principles of food preparation (methods of cooking)
- Food preparation and service terminology
- Standardized recipes: weighing, measuring, conversion
- Use of food service equipment
- Use and care of food service utensils
- Food preparation: Short order, fast foods
  - Beverages
  - Salads
  - Garnishes
  - Adding finishing touches
  - Sandwich fillings
  - Sandwiches
  - Deep fat frying
- Career opportunities in food service
- Food preparation - pre-paration
- Food preparation - Breakfast foods
- Food preparation: (NOTE: tasks to be determined by student's needs)
- Ordering, receiving inventorying
  - Inspecting incoming foods and beverages
  - Storing equipment and supplies

SERVICE

- Food preparation and service terminology
- Food preparation:
  - Adding finishing touches to prepared foods
- Career opportunities in food service:
  - Waitress/waiter
  - Counter helper
  - Bus service
- Preparation for and serving foods:
  - Table service
  - Fill condiments
  - Fill beverage/ice containers
  - Portion and display foods
  - Prepare serving line
  - Hand serve foods
  - Present check to customer
- Food preparation: Tasks based on student's need

SEEKING EMPLOYMENT

- Preparing for work:
  - Labor laws and regulations
  - Payroll deductions
  - Job opportunities
  - Applications
  - Interviewing

HANDLING REQUESTS FOR PROGRAM DOCUMENTS

Attached are samples of typical letters requesting program materials that have been received by the Occupational Education Articulation Program.

These requests illustrate the interest in and need for articulation or competency-based resource materials.

In the original project proposal, it was stated that a secondary goal for the project was to provide information which might be used as a "model" for others to emulate.

The products developed in the project are suitable for sharing information with similar programs involving both articulation or competency-based curriculum guide development.

To share curriculum and articulation materials developed by the Occupational Education Articulation Program, requests for materials/documents are answered by a "form letter" indicating the materials produced to date and how copies may be obtained on loan, in print, or on microfiche.

Because the project was limited in budget, time, and personnel, this was the most appropriate method of sharing research and information.

Durham Technical Institute
1637 Lawson Street · Durham, North Carolina, 27703 · (919)596-9311

November 23, 1982

Mr. Ed Henderson
OE Coordinator
Occupational Education Articulation Program
Greenville County Schools
Box 2848
Greenville, SC 29602

Dear Mr. Henderson:

We would be most interested in obtaining copies of the completed curriculum guides for Accounting I and II, Business English, Drafting I, Office Procedures, Shorthand I and II, and workshop guides and handouts on writing objectives, standards, tests, etc. We read of your work in the September issue of OPEN ENTRIES.

Please send us information regarding the purchase of these items. We will be working in the area of CBE within accounting and shorthand very soon. Thank you for your assistance.

Sincerely,
Michael C. Allison
Michael C. Allison
Competency-Based Education Coordinator

L-2

"Education That Works"
Durham Technical Institute is an Affirmative Action / Equal Opportunity / Section 504 Institution / M/F

Kentucky Department of Education
Raymond Barber, Superintendent of Public Instruction

December 13, 1982

Mr. Ed Henderson
OE Coordinator
Occupational Education Articulation Program
Greenville County Schools
Box 2848
Greenville, SC 29602

Dear Mr. Henderson:

I read with interest about your curriculum guides for six secondary programs in the September issue of OPEN ENTRIES. I would appreciate it if you could send me information regarding the availability and cost of the curriculum guides for Accounting I and II, Business English, Drafting I, Office Procedures, Shorthand I and II, and Typing I and II. In addition I am interated in receiving future copies of Drafting II and Welding when they are available for distribution.

In Kentucky we are in the process of reviewing curriculum guides for these areas and your immediate response would be most appreciated.

Sincerely yours,

Melissa Briscoe, Director
Division of Materials and Curriculum

MB:rls

Kentucky Department of Education, Capital Plaza Tower, Frankfort, Kentucky 40601

JEFF TECH

Reynoldsville, Pennsylvania 15851
814-653-8265

December 20, 1982

Mr. Ed Henderson
OE, Coordinator
Occupational Education Articulation Program
Greenville County Schools
Box 2848
Greenville, South Carolina 29602

L-3

Dear Mr. Henderson:

Please send us information on project activities of the competency-based vocational education [CBVE] for secondary and postsecondary training programs.

Thank you.

Respectfully,

Roger I Keith

ROGER I. KEITH
Coordinator of Adult Education & Curriculum

Jefferson County-DuBois Area Vocational-Technical School
Jeff Tech does not discriminate on the basis of sex, race or handicap

---

October 14, 1982

Mr. Ed Henderson, OE
Coordinator
Occupational Education Articulation Program
Greenville County Schools
Box 2848
Greenville, SC 29602

Dear Mr. Henderson:

We are beginning to implement competency based instruction in our Vocational School. We are trying to develop this for each program in our facility.

I am in hopes that your project may provide beneficial information to aid us in this process.

Any literature, suggestions, etc., would be appreciated.

Sincerely yours,

Rosemary Elliott

Rosemary Elliott
Vocational Resource Educator

mb

UCA
75
UNIVERSITY OF CENTRAL ARKANSAS • CONWAY, ARKANSAS 72032

January 26, 1983

Ed Henderson, OE, Coordinator
Occupational Education Articulation Program
Donaldson Vocational Center
Greenville County Schools
Box 2848
Greenville, SC 29602

Dear Mr. Henderson:

Re: Open Entries - Materials Wanted - December, 1982

We too are interested in the competency-based materials, especially performance checklists/task lists for the instructional areas you mentioned in Open Entries. We would appreciate any information you could share as we begin the early stages of a competency certificate system for both secondary and postsecondary.

Hopefully we can give assistance to you later in the year as the project develops.

Receipt of any information will be greatly appreciated.

Yours truly,

Carolyn Dillion

Carolyn Dillion, (Acting) Project Coordinator
Competency Certification System
University of Central Arkansas
P. O. Box 1765-U
Conway, AR 72032
(501) 450-3139

CD:ni

Cape Cod Tech
432-4500
771 2600

Cape Cod Regional Technical High School
Pleasant Lake Avenue
Harwich, MA. 02645

Wilfred H. Learned, Jr.
Superintendent-Director

F. Timothy Carroll
Assistant Superintendent-Director

December 1, 1982

Ed Henderson, OE, Coordinator
Occupational Education
Articulation Program
Greenville County Schools
Box 2848
Greenville, S.C. 29602

Dear Mr. Henderson:

In the September 1982 issue of OPEN ENTRIES, under the paragraph entitled CBVE BONUS: ARTICULATION, it was stated that there are competency-based curriculum guides for six secondary programs. I would particularly like to receive the guides for Drafting I and Typing I and II.

Thank you for your attention to this request.

Very truly yours,

Timothy Carroll

Timothy Carroll
Principal

mld

ACCTion CONSORTIUM
Eastern Regional ACCTion Center • Tri-County Technical College
P. O. Box 587, Pendleton, South Carolina 29670 • (803) 646-7565/646-8361

October 29, 1982

Mr. Ed Henderson
OE, Coordinator
Occupational Education Articulation Program
Greenville County School
Box 2848
Greenville, SC 29602

L-5

Dear Mr. Henderson:

Please send copies of the articulated, competency-based curriculum guides for secondary programs. Account I and II, Business English, Drafting I, Office Procedures, Shorthand I and II and Typing I and II. Please also send a copy of the reference tools you have prepared including a policies-and-procedures manual for administrators.

We would like to include this materials in the ACCTion Consortium Resource Center.

Thank you.

Sincerely,

Mary Ellen Duncan

Mary Ellen Duncan, Director
Eastern Reginal ACCTion Center

Enclosure

national technical assistance consortium for two-year colleges

Southeastern Regional ACCTion Center
Brevard Community College
1519 Clearlake Road, Cocoa, FL 32922
(305) 632-1150/ 632-1111

North Central Regional ACCTion Center
Kirkwood Community College
P. O. Box 2068, Cedar Rapids, IA 52406
(319) 398-5529

Western Regional ACCTion Center
Lower Columbia College
1600 Maple, Longview, WA 98632
(206) 577-2300

John Wiley & Sons, Inc
Publishers
605 Third Avenue
New York, NY 10158
212-850-6707

rd Avenue
rk, NY 1015
-7063
NWILE
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, Toronto

John Wiley & Sons, Inc. Publisher

Alan B. Lesure
Executive Editor
Business, Technical &
Occupational Education

onal Group

October 22, 1982

Mr. Ed Henderson
Coordinator, Occupational Education
  Articulation Program
Greenville County Schools
Box 2848
Greenville, SC 29602

Dear Mr. Henderson:

Recently I was reading in the OPEN ENTRIES newsletter that you are developing, and have developed in the past, curriculum guides for various vocational programs.

I would appreciate getting copies of the curriculum guides, when they are available, on Automotive Mechanics, Carpentry, Commercial Cooking, Drafting II and Welding. Any other general information you could send would be greatly appreciated.

Sincerely,

Alan B. Lesure
Publisher

ABL/nl
W10/Fri-04

Occupational Education Articulation Program
of The School District of Greenville County
and Greenville Technical College

Thank you for your inquiry and interest concerning the Occupational Education Articulation Program.

Material produced by the Occupational Education Articulation Program currently includes:

1981-1982

Workshop Guide I: Writing Performance-based Objectives, Task Actions, and Performance Standards (140 pages)

Workshop Guide II: Writing Outcome-referenced (criterion-referenced) Tests (71 pages)

Policies and Procedures Guide for Articulation of Occupational Education Programs Between The School District of Greenville County and Greenville Technical College (110 pages)

Articulated, Performance-based Instruction Guide for Drafting I (265 pages)

Articulated, Performance-based Instruction Guide for Business and Office Education (625 pages) with Modules for:

- Typewriting I and II (160 pages)
- Shorthand I and II (100 pages)
- Accounting I and II (95 pages)
- Office Procedures (110 pages)
- Business English (125 pages)

Final Report, Volume I, 1981-1982, Occupational Education Articulation Program (15 pages)

1982-1983

Articulated, Performance-based Instruction Guide for Automotive Mechanics (450+ pages)

Articulated, Performance-based Instruction Guide for Building Construction/Carpentry (300+ pages)

Articulated, Performance-based Instruction Guide for Food Service/Commercial Cooking/Food Service Manangement (420+ Pages)

Articulated, Performance-based Instruction Guide for Welding (210+ pages)

Articulated, Performance-based Instruction Guide for Drafting II (100+ pages)

Final Report, Volume II, 1982-1983, Occupational Education Articulation Program 10 pages)

To aid others in the development of articulation or performance-based (competency-based) materials, copies of documents and guides produced by this Program are available from the following sources.

1. National sources:

ERIC Clearinghouse
Adult, Career, and Vocational Education
Ohio State University
1960 Kenny Road
Columbus, OH 43210

Southeast Curriculum Coordination Network
Research and Curriculum Unit
Mississippi State University
P.O. Drawer DX
Mississippi State, MS 39762

2. State sources:

S.C. Council on Vocational and Technical Education
Attention: Dr. Robert H. White
221 Devine Street, Suite 420
Columbia, SC 29205

Office of Vocational Education
South Carolina State Department of Education
Attention: Dr. Robert T. Benson
Chief Supervisor, Curriculum Development
Rutledge Building
Columbia, SC 29201

S.C. State Board of Technical and Comprehensive Education
Division of Educational Services
Attention: Dr. Cecil Walters
111 Executive Center Drive
Columbia, SC 29210

3. Local sources:

The School District of Greenville County
Professional Library
P.O. Box 2848 - 301 Camperdown Way
Greenville, SC 29602

4. In addition, copies of documents have been provided to Business and Office Education and Trade and Industrial Supervisors in the Office of Vocational Education, S.C. State Department of Education. Complete sets of documents have been provided to each Vocational Education Center Director, The School District of Greenville County. Complete sets of documents are available in the office of Mr. Richard Cothran, Consultant for Vocational Education, The School District of Greenville County; and Dr. Kay Grastie, Associated Vice President for Instruction, Greenville Technical College.

The Policies and Procedures Guide and the two Workshop Guides contain state-of-the-art references concerning articulation, the development of performance-based (competency-based) curriculum material, and outcome-referenced (criterion-referenced) tests. These documents are designed so that principals or others might use them in coordinating the development of articulation or competency-based vocational education materials.

Each instruction guide contains the references used to develop the course objectives, actions, standards, and tests as well as sources concerning articulation or competency-based vocational education.

We hope this information and referral will answer your inquiry. Please contact us if you have specific questions that are not answered or if we might be of further assistance.

Sincerely yours,

Wm. Edward Henderson Jr.

Wm. Edward Henderson Jr., Coordinator
Occupational Education Articulation Program

WEH/tae

BINDER DESIGN

(Occupational Education Articulation Program)

The binder design is simple and straightforward.

Two triangular figures, in balance, represent the two institutions participating in articulation.

Two levels of training, secondary and post-secondary, are represented by the placement of the triangles and the identification of the two institutions.

Horizonal and vertical lines represent lateral and vertical articulation.

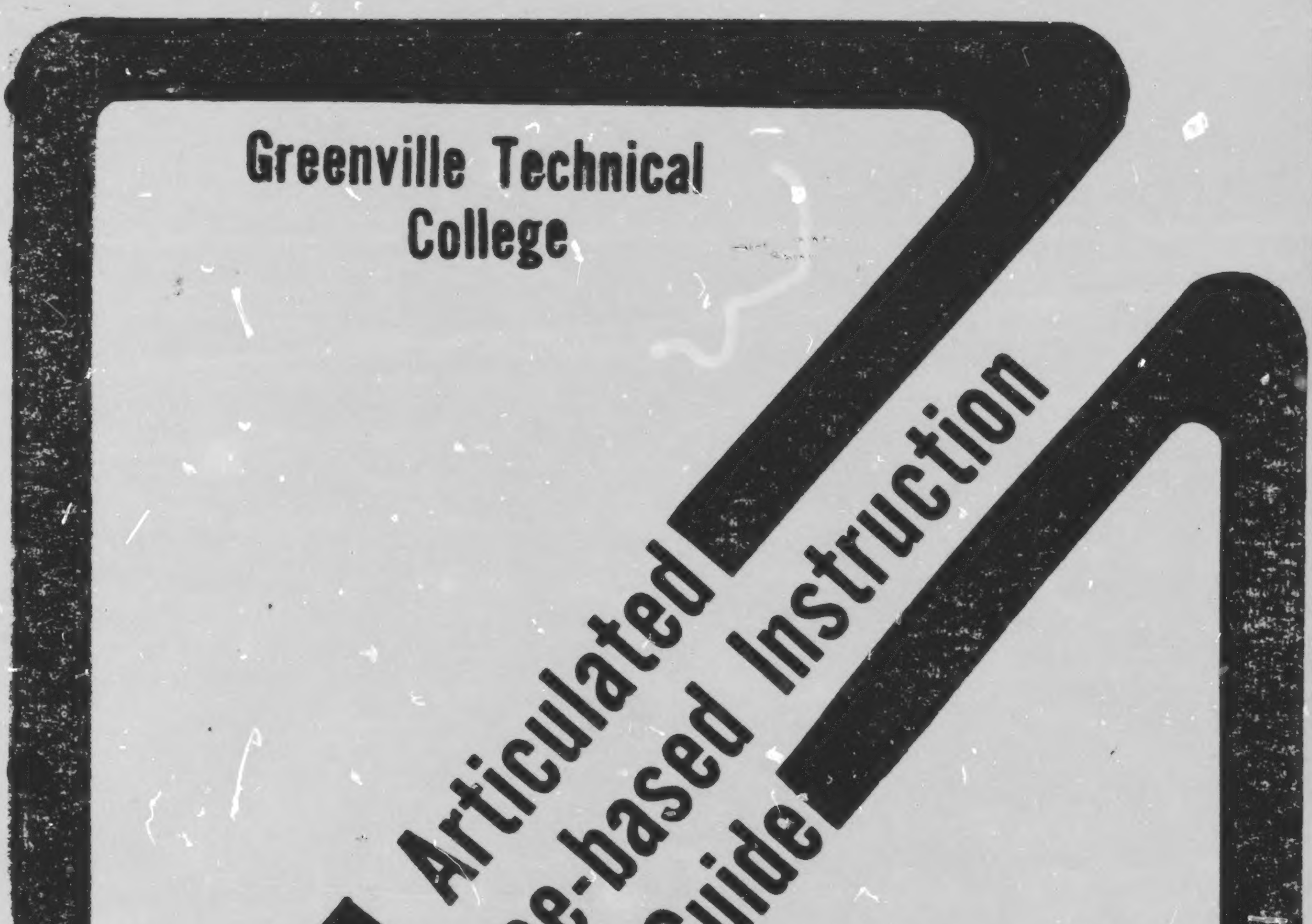
The diagonal across the design represents the progressive movement in career development for successful job performance.

The two figures do not close where they face representing interaction and are linked by the document titles: "Articulation Policies and Procedures Guide" or "Articulated, Performance-based Instruction Guide."

The binder design was developed by Mr. Ed Henderson Jr., Coordinator, Occupational Education Articulation Program.

Original binder covers by the Graphics Arts program
Donaldson Vocational Center
The School District of Greenville County

Subsequent binders screened by EMJ, Greenville, SC



Greenville Technical
College

Articulated
Performance-based Instruction
Guide

The School District
of Greenville County

M-2 194

Greenville Technical
College

Articulation Policies and Procedures Guide

The School District
of Greenville County

THIS DOCUMENT AND BINDER ARE THE PROPERTY OF THE SCHOOL DISTRICT OF GREENVILLE COUNTY OR GREENVILLE TECHNICAL COLLEGE

The production of this curriculum guide and binder by the Occupational Education Articulation Program was funded through the South Carolina Appalachian Council of Governments. This guide and binder are the property of The School District of Greenville County or Greenville Technical College.

Except for document and binder copies that have been placed in libraries or shared with educational organizations, the documents and binders are issued on an accountability basis.

Documents and binders issued to instructor participants remain the property of the issuing institution. Should a vocational instructor leave the employment of The School District of Greenville County or Greenville Technical College, the document and binder must be returned to the principal, vocational center director, or department head so the instruction guide may be used by replacement personnel.

Corrections, modifications, and notes may be made on the pages of the documents for the purpose of modifying the field trial edition or to improve the instructional value of the document. Please share any corrections, modifications, and recommendations concerning this document with the Occupational Education Articulation Program.

Illegible or blank document page replacements may be requested at no cost through the Occupational Education Articulation Program. For replacement pages, please indicate:

Document Title
Module Number
Task Number or Page Number

Replacement costs for this document and binder are:

1" Binder - $2.80
2" Binder - $5.00
Document - .05¢ per page (1982)

Who to contact:

Occupational Education Articulation Program
The School District of Greenville County
c/o Donaldson Vocational Center
Donaldson Center
Greenville, SC 29605
(or)
Consultant, Vocational Education
The School District of Greenville County
(or)
Associate Vice President for Education
Greenville Technical College

INTRODUCTORY GUIDE
TO THE
OCCUPATIONAL EDUCATION ARTICULATION PROGRAM

by

Wm. Edward Henderson, Jr.
Articulation Program Coordinator

June, 1983

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PREFACE

This introduction to the Occupational Education Articulation Program has been assembled to familiarize task force committee participants with the articulation program and with the program participants.

The information included should provide answers to most general questions and should provide an outline of the activities that will follow the development phase.

The articulation program and the articulation guide development activity are based on a management by objectives and instructional systems approach. Guide development will proceed by proven techniques and will work if plans are followed and schedules are met.

If a vocational program is too complex to complete in one year because of the number of major tasks, emphasis will be on completing a minimum of the first year of the program so there will be a foundation for further development and completion of the program guide.

This introductory guide should be kept for reference concerning the basis of guide development and use.

Greenville, SC W.E.H.

GENERAL INFORMATION
TASK FORCE COMMITTEE PARTICIPANTS
OCCUPATIONAL EDUCATION ARTICULATION PROGRAM

Task force committee meetings held during the school day are classified as "Release Time" with the School District funding substitutes for secondary personnel and Greenville Technical College funding substitutes for its instructors.

Each participant must arrange for a substitute within school policies.

Notices concerning school day meetings will include a "Release Time" Account Number which the secondary school secretary will use to pay the substitute. This Account Number will be provided to the secondary school director/principal also.

Participants will be asked to sign a roster at each task force committee meeting so that the actual manhours involved in the development of the articulation document can be calculated and reported.

For after school hours or summer meetings, the Articulation Program will pay the participant based on a six (6) hour day at the prevailing rate for a substitute teacher. For 1/2 day, the rate would be half.

The task force committee meeting day typically will begin at 8:30 a.m. and conclude at 3:30 p.m.

Payment for meetings held during other than school hours require a signature and all information requested on the participation roster. Stipend payments normally take about 2-3 weeks to process after a meeting.

The School District of Greenville County policy does not allow the awarding of in-service credit during school hours (release time) or when you are paid a stipend (dual payment if in-service credit was given).

For convenience, meetings generally will be held at the Administrative Office of The School District of Greenville County or at Donaldson Career Center. Ample parking is available at both locations. Parking at the District Office is to the rear of the building. Parking at Donaldson Career Center should not block bus traffic.

You will be on your own for lunch. One hour is provided, starting at 11:30 a.m. so that you can beat the lunch crowd if you choose to eat out. You may wish to bring your lunch.

Sometimes, there may be meetings when only one or two persons show up because of the size of the task force committee and personal responsibilities, etc. Generally, we will meet to continue the development of articulation guides even if only one or two persons show. Emphasis must be on the forward movement of program activities to reach the objectives within the given time limits.

Any curriculum guides or references that you use or have available may help your task force committee and you write objectives, actions, standards, and tests. Some reference materials have been acquired by the Articulation Program so that the Program Coordinator will be able to follow your curriculum description. Please bring texts, workbooks, test booklets, and reference materials that will make the job of writing the curriculum description easier.

IF YOU HAVE RECENT/APPLICABLE "TASK ANALYSIS" INFORMATION, PLEASE SHARE IT WITH THE TASK FORCE COMMITTEE!

The development of the articulated, performance-based instruction guide and the articulation program follow clearly established steps that work!

The overall operation of the Articulation Program is clearly outlined in the Articulation Policies and Procedures Guide.

Workshop guides contain step-by-step information concerning what to do and how to keep on target as you develop the task list, objectives, performance actions, competency standards, and outcome-referenced tests of the articulation guide. These workshop guides were developed to help you accomplish program goals. They have been field trial tested and revised. They work! Your suggestions and ideas on improving the guides will be most appreciated. In addition, "workshop forms" will be used to standardize and simplify the writing process.

The articulated, performance-based instruction guide that you develope will be used as the framework for vertical articulation between the School District vocational programs and the similar vocational program at Greenville Technical College. In addition, the guide will promote standardization at the secondary level through lateral articulation between career centers. The guide probably will become the official curriculum guide for your program since it will encompass all existing curriculum descriptions, will include state-of-the-art information, and will be based on local "task analysis."

The articulation guide will be shared with the S.C. State Department of Education, Office of Vocational Education; the S.C. State Board for Technical and Comprehensive Education; the S.C. Council for Vocational and Technical Education; ERIC Clearinghouse on Vocational Education; Southeast Curriculum Coordination Network; and other curriculum research/resource centers/libraries.

INTRODUCTION TO THE
OCCUPATIONAL EDUCATION ARTICULATION PROGRAM
of
THE SCHOOL DISTRICT OF GREENVILLE COUNTY
and
GREENVILLE TECHNICAL COLLEGE

BACKGROUND

For the past ten or more years, vocational and technical education circles have promoted the process of articulation to reduce unnecessary gaps or overlap in career training. During this period of time, many states and local communities have forged ahead to establish effective articulation programs that have proven their value by reducing duplication in training.

The School District of Greenville County and Greenville Technical College began working toward the development of an articulation program in 1976. In 1981, the Occupational Education Articulation Program was initiated as a joint effort of The School District of Greenville County and Greenville Technical College.

During 1981, Dr. J. Floyd Hall, Superintendent, The School District of Greenville County, and Dr. Thomas E. Barton, President, Greenville Technical College, signed a formal agreement "to fully support the concept of articulation and agree upon the purposes of the articulation program."

In the May, 1982, issue of South Carolina Schools, Director Moody Oswald, SC State Department of Education's Office of Vocational Education, and G. William Dudley Jr., Executive Director, State Board for Technical and Comprehensive Education, issued the joint statement: "We have been encouraging articulation of programs between vocational and technical education for about six years. ...We believe in articulation and encourage it."

The Occupational Education Articulation Program was initiated at a time when there was mutual interest among teachers, institutions, potential employers, and the community in providing career preparation that is financially and educationally efficient.

The following vocational education programs were articulated during the first year of the Occupational Education Articulation Program in Greenville County: Typewriting I and II, Shorthand I and II, Accounting I and II, Office Procedures, Business English, and Drafting I. In addition, support documents such as the Articulation Policies and Procedures Guide and how-to-do-it workshop guides were developed. During 1982-1983, the Phase One articulation guides were field trial tested.

In March, 1982, Phase Two of the Occupational Education Articulation Program began. Additional vocational programs for which articulation guides have been developed include: Automotive Mechanics, Carpentry, Drafting II, Food Service, and Welding.

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Phase Three of the program will include the articulation of Air Conditioning and Refrigeration, Auto Body Repair, Electricity, Machine Shop, and Masonry,

THE NEED FOR ARTICULATION

The need for articulation is emphasized by secondary vocational program graduates who want to continue their career development at the technical education level, but who instead become frustrated and drop out because they are faced with repeating the same things they have learned previously.

As a solution to this situation, similar secondary and post-secondary vocational education programs are clarified through articulated, competency-based curriculum descriptions. These curriculum guides describe the minimum tasks or objectives of the vocational field as well as the minimum standards of performance expected for entry level employment success.

The process of articulation will not remove all overlap between secondary and post-secondary vocational education programs. Articulation, however, can emphasize the unique contribution of each level of career development and can reduce unnecessary duplication in training.

ARTICULATION

Simply stated, articulation is a clear expression and joining of two similar levels of career training into a continuous sequence to benefit students, educators, employers, and taxpayers.

Typically, we think of vertical articulation between secondary and post-secondary vocational training programs. Equally important is lateral articulation between similar secondary level vocational programs within the School District.

PURPOSES OF ARTICULATION

Articulation is designed to help remove unnecessary gaps or overlap in student learning which sometimes occurs when the student completes a secondary program and continues career development at the technical college level.

Articulation is designed to develop a continuous line of vocational training so that students may continue their education without loss of time or waste of effort in repeating tasks which have been learned previously.

PUTTING ARTICULATION INTO ACTION THROUGH COMPETENCY-BASED EDUCATION

To accomplish articulation in Greenville County, conventional secondary level vocational programs are being modified into competency-based education (CBE).

The first step to develop CBE is to identify a valid list of the key tasks performed by the worker in the vocation. Next, the minimum steps to accomplish the tasks or jobs are arranged in a sequential order. Finally, the minimum standard of performance for each task is specified. The minimum standard represents the competency necessary for success in entry level employment in the vocation.

Everything in CBE is made public before instruction. When the student begins a competency-based vocational education program, information is available to tell the student: (a) exactly what competencies are expected to be developed as a result of the training, (b) how the student will be evaluated and against what standards, and (c) how the student's competencies will be communicated to the student, other educators, and future employers. There are no surprises for students, teachers, administrators, or employers.

SOME CHARACTERISTICS OF CBE

Competency-based education is goal based. The most important type of goal is the competency which requires the student to apply the skills and knowledges necessary to be successful in entry level employment.

In competency-based vocational education, potential employers are involved in determining the objectives and standards of the training program.

In CBE, the student is expected to know the "why" and "how" of the vocation, but emphasis is placed on the "ability to do."

As much as possible, CBE is based on realistic problems and situations and training in the field is encouraged.

Typically, CBE is well planned and systematic, but it is flexible also. In CBE, learning is individualized to the maximum extent. CBE provides a method of frequent feedback to guide learning experiences.

Accountability for student progress in CBE is placed squarely on the shoulders of both the "student and the instructor."

BENEFITS FROM ARTICULATION

Articulation enables the secondary school graduate to enter a very similar vocational program at the TEC level and pick up with the next logical step in career development.

Through articulation, there is a minimum of duplication in time and cost and maximum benefits in terms of knowledge and proficiencies gained from the educational program.

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The articulation process requires teachers and administrators from different schools to work closely together, encourages cooperation between instructors, and results in a more uniform curriculum program.

For vocational students, career and educational alternatives are being increased while training time and costs should be decreased.

Articulation facilitates the progression of the student through vocational training and into the work force.

As a by-product of articulation, vocational training should become more relevant to actual job tasks. Graduates should be more productive employees due to their training.

As articulation is thoroughly developed, the taxpayers of Greenville County will gain through the savings of tax dollars that result from more efficient vocational and technical training.

For further information, contact:

Ed Henderson Jr., Coordinator
Occupational Education Articulation Program
of The School District of Greenville County
and Greenville Technical College
c/o Donaldson Vocational Center
Donaldson Center
Greenville, SC 29605

Contact at The School District of Greenville County:
Mr. Richard Cothran, Consultant, Vocational Education

Contact at Greenville Technical College:
Dr. Kay Grastie, Associate Vice President for Instruction

4/83

PHILOSOPHY OF ARTICULATED, PERFORMANCE-BASED INSTRUCTION GUIDES

The design of the articulated, performance-based instruction guides and the articulation program is based on a philosophy that the vocational education curriculum should be for career training with few fringe or non-related subjects. The student should be given the basis to do useful skilled work upon graduation and employment. The vocational program graduate should have a background which will allow him/her to learn and advance as rapidly as possible on the job, but it should not include subject matter which will not be applicable to his/her work for years. When subject matter is introduced that will not be applicable to the graduate's work for years, it may put the graduate out of perspective. The result might be that the graduate may try to force applications which do not exist, simply because the information is in his/her repertoire. Thus, the purpose of vocational training by the articulated, performance-based instruction guides is to prepare graduates for successful entry into a skilled trade.

To ensure that the design of the articulated, performance-based instruction guides is conforming to the philosophies of both the secondary and post-secondary institutional participants, a periodic review of the guide design and philosophy is recommended.

PURPOSES OF THE ARTICULATED INSTRUCTION GUIDE

The articulated instruction objectives guide are is expected to serve the following purposes:

1. The guide serves as the primary vehicle for the articulation of subject matter in similar vocational training programs between the vocational education centers, high schools, and Greenville Technical College through use by instructors at both levels as a reference in preparing instruction.

2. The guide provides a listing of the minimum tasks that a student or worker is expected to perform in the conduct of a specific level job in the area of vocational training or work of concern.

3. The guides identify the primary detailed instruction objectives, performance objectives which are based upon the task listings. The tasks are listed in the sequence of complexity, with the least complex task being listed first, except where a task must be performed as a prerequisite to performance of another task.

4. The guides identify the tasks performed (actions, steps, sets of skills) and related technical information which must be taught and learned to accomplish each major instruction objective. The tasks performed represent the minimum skills and related information required for adequate occupational proficiency in the performance objectives.

5. The guides designate the instructional contact hours necessary to provide the required instruction, as required by appropriate educational agencies or offices and as estimated by the instructor-participants on the Vocational Articulation Project Task Forces, and based on the time required to teach the average learner to perform the task. The time estimated is based on having the essential equipment, facilities and instructional aids required to provide the instruction, whenever the class size is limited to an acceptable number.

6. The guides identify the performance standards to be met for occupational proficiency in the task. Performance standards used are those considered to be minimum business or industry standards. The ability to meet the listed standards of performance will be considered as qualification for advanced instruction in the vocational program.

7. The guides provide direction in the conduct of sequential vocational competency instruction by modules or job tasks, resulting in qualification by the learner to perform limited skill specialist jobs of

progressively higher skills until the program objective is reached (i.e., file clerk to executive secretary, etc.). As the student becomes proficient in the performance of tasks in successively more complex modules, more marketable competencies are gained and may be identified as the lower job qualifications of a specialist.

Through this procedure, even the slower student is provided an opportunity to eventually gain sufficient skills to perform adequately as a specialist at some level in the vocational field, even if the student is unable to complete the total program of training.

The standardized sequence of activities of the vocational instruction modules will facilitate lateral articulation between vocational education centers in the School District and will simplify vertical articulation when training is continued at Greenville Technical College articulating to employers.

8. The guides provide a descriptive listing of equipment required to conduct the program of vocational training. The equipment listed is considered to be the type and quantity essential for the conduct of instruction to prepare students for entry-level employment in the vocational field. It may be necessary to delay teaching some tasks involving special equipment, if that equipment is not available at all instructional sites, or to move students and equipment together as necessary to teach skills.

9. The guide provides information about requirements or limitations that typically are involved in the performance of the task, environmental conditions and physical demands, and able to perform the task.

10. The guides provide a list of standardized performance test items/ and outcome-referenced measures to be used in the determination of vocational proficiency. As long as the specifics are not provided, the test items listed cannot be compromised easily and could serve as study guides.

11. The tasks listed in the guide are the minimum requirements for job qualification under average circumstances in a regional market. It is understood that there may be unlisted tasks that some employers may require the worker to do in the occupation, when in their employment. In addition, there may be unlisted tasks, such as mental process tasks, that are not stated but that may occur and that should be considered in instructional planning or testing.

Instructors may teach skills and related technical information other than what is shown in the guides. Provision of additional information should be limited to the students who have completed the requirements for the tasks emphasized in the instructional guides. The change of tasks in the guides should be based on task force committee agreement to ensure lateral and vertical articulation.

12. It is expected that there will be updating and correction of items in the articulated instruction guide. Participants are to be sure that the contents are valid and consistent with business and industry requirements. Recommendations should be submitted to the Vocational Articulation Program office which will assemble and present them to the appropriate committee for review and possible adoption.

13. Typically, the teacher/instructor should not plan to conduct instruction in a given articulated module unless the capability exists to conduct all of the instruction to meet the instructional objectives, with the result that the successful student is qualified to perform the tasks identified within the module.

14. An underlying philosophy in vocational training is that it is better to prepare the student to be fully qualified to perform all of the tasks in a limited group of modules in a vocational field and be qualified at a lower job level rather than to be only familiar with a large number of task descriptions or duties and qualified to perform none of them fully. For higher levels of job qualification beyond the secondary level, the student or worker is encouraged to enroll at Greenville Technical College.

15. Generally, vocational programs will include certain basic modules or courses of instruction without which the student would not be considered vocationally qualified at any level. Basic modules typically will be identified and taught early in the program sequence.

16. The instruction guides provides information essential to help the vocational student who completes training at the secondary level and continues career development training at the post-secondary level in a similar program receive appropriate credit for the articulated vocational training that has been mastered at the secondary level.

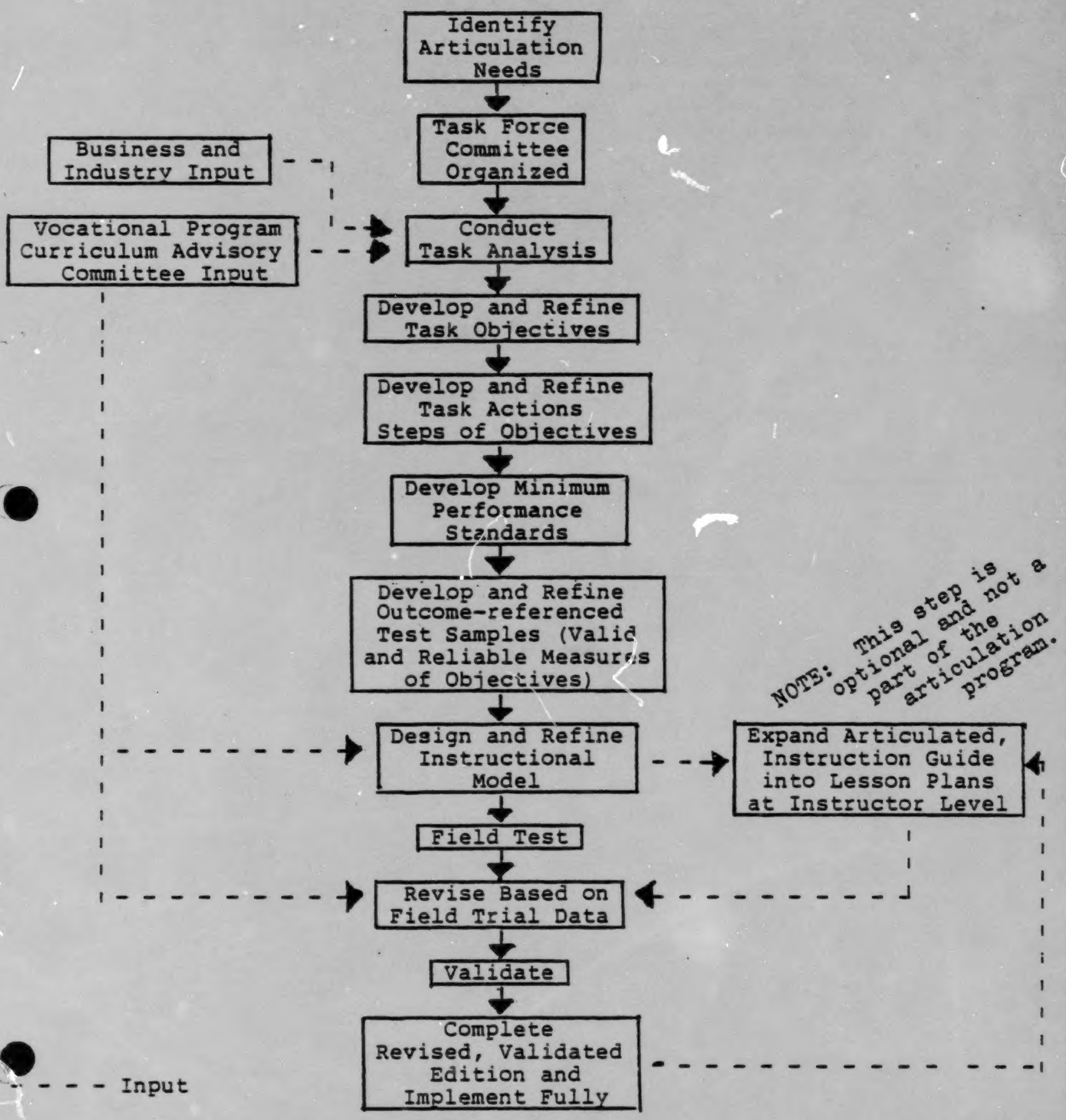
ARTICULATED, PERFORMANCE-BASED INSTRUCTION GUIDES ARE DESIGNED TO ANSWER THREE CRITICAL QUESTIONS NECESSARY FOR QUALITY INSTRUCTION

1. What should be taught?	The objectives of the articulated, performance-based vocational education program are based on extensive task analysis and validation. The task objectives represent what employers in business and industry say is important for entry level job success.
2. How should it be taught?	It should be taught using the latest instructional technology incorporated into each unit. Students are taught the knowledge, skills, and attitudes needed for successful and productive employment. State-of-the-art instructional technology is encouraged.
3. How should students be evaluated?	Students are evaluated using a validated competency-based approach to determine student proficieny in knowledge and skills. The minimum standards are those required for successful entry in the next higher level of training or for successful employment.

BENEFITS OF ARTICULATED, PERFORMANCE-BASED EDUCATION

1. Students who prove their vocational competencies at the secondary level and continue similar training at the post-secondary level are given credit for past experience and training.
2. The vocational program is performance-based and not time-based.
3. No one text determines the curriculum and content involves very little, if any, guess work.
4. Students in an "effective" performance-based vocational program progress faster.
5. The articulated, performance-based vocational program is flexible allowing for individual variations in students, instructors, and program facilities and equipment. The program provides a standardized framework but allows the instructor creative freedom.

SCHEMATIC OF
ARTICULATED, PERFORMANCE-BASED INSTRUCTION GUIDE
DEVELOPMENT PROCESS


Identify Articulation Needs
Task Force Committee Organized
Business and Industry Input
Vocational Program Curriculum Advisory Committee Input
Conduct Task Analysis
Develop and Refine Task Objectives
Develop and Refine Task Actions Steps of Objectives
Develop Minimum Performance Standards
Develop and Refine Outcome-referenced Test Samples (Valid and Reliable Measures of Objectives)
NOTE: This step is optional and not a part of the articulation program.
Design and Refine Instructional Model
Expand Articulated, Instruction Guide into Lesson Plans at Instructor Level
Field Test
Revise Based on Field Trial Data
Validate
Complete Revised, Validated Edition and Implement Fully
---- Input

Schematic design by Ed Henderson Jr., 1982.

SIMPLIFIED STEPS
OF THE DEVELOPMENT OF
ARTICULATED, PERFORMANCE-BASED INSTRUCTION GUIDES

DOCUMENT PRE-DEVELOPMENT ACTIVITIES

(WS) WORKSHOP TO ENSURE ALL TASK FORCE COMMITTEE PARTICIPANTS ENTER THE DEVELOPMENT PROCESS WITH A COMMON UNDERSTANDING OF THE PROGRAM, TASKS EXPECTED OF THEM, AND A COMMON LANGUAGE

↓

SURVEY SIMILARITIES OF SECONDARY AND POST-SECONDARY PROGRAMS

↓

DESCRIBE SECONDARY AND POST-SECONDARY SIMILAR PROGRAMS OF TRAINING: CURRICULUM AREAS TO BE DEVELOPED INTO COMPETENCY-BASED DESCRIPTION

↓

IDENTIFY STATE AND LOCAL EDUCATIONAL STANDARDS

↓

(WS) WORKSHOP PRECEEDS TASK ANALYSIS TO IDENTIFY PERFORMANCE EXPECTATIONS OF POTENTIAL EMPLOYERS

↓

INPUT FROM CURRICULUM ADVISORY COMMITTEES THROUGH INSTRUCTOR/INSTITUTIONAL PARTICIPANTS (SURVEYS AS NECESSARY)

↓

DOCUMENT DEVELOPMENT PROCESS

(WS) WORKSHOP ON WRITING OBJECTIVES, ACTIONS, AND STANDARDS

↓

DEVELOP VALID TASK LIST OF PERFORMANCE OBJECTIVES

↓

ARRANGE PERFORMANCE OBJECTIVES IN LEARNING SEQUENCE

↓

SEQUENCIAL LISTING OF PERFORMANCE ACTIONS TO REACH OBJECTIVES

↓

IDENTIFY PERFORMANCE STANDARDS FOR TASK COMPETENCY

↓

IDENTIFY "SUGGESTED INSTRUCTIONAL TIMES" FOR PLANNING PURPOSES

↓

IDENTIFY RELATED TECHNICAL INFORMATION FOR EACH OBJECTIVE

↓

REVIEW OF OBJECTIVES, ACTIONS, AND STANDARDS BY CURRICULUM ADVISORY COMMITTEES THROUGH TASK FORCE COMMITTEE PARTICIPANTS

↓

(WS) WORKSHOP PRECEEDS DEVELOPMENT OF OUTCOME-REFERENCED TEST SAMPLES

↓

REVIEW TEST ITEMS AGAINST OBJECTIVES TO ENSURE THERE IS AGREEMENT IN CONDITION, PERFORMANCE, AND STANDARDS

↓

SUMMARIZED INSTRUCTIONAL TIME ESTIMATES AND ADJUST TO EQUAL PROGRAM REQUIREMENTS

↓

LIST MINIMUM TRAINING EQUIPMENT

↓

DEVELOP STATE-OF-THE-ART BIBLIOGRAPHY

↓

IDENTIFY AND DEVELOP APPENDIXES

↓

POST-DEVELOPMENT PROCESS

MUTUAL AGREEMENT (SIGNED BY INSTRUCTOR PARTICIPANTS) CONCERNING ARTICULATION DOCUMENTS

↓

(WS) ORIENTATION WORKSHOP TO EXIT DEVELOPMENT PROCESS: SUMMARIZE ARTICULATION PROGRAM AND COMPETENCY-BASED INSTRUCTION TO ALL TEACHER PARTICIPANTS

↓

FIELD TRIAL IMPLEMENTATION, VALIDATION STUDY

↓

CORRECTIONS, REVISIONS, AND MODIFICATIONS BASED ON FIELD TRIAL FINDINGS

↓

FULL IMPLEMENTATION OF GUIDES

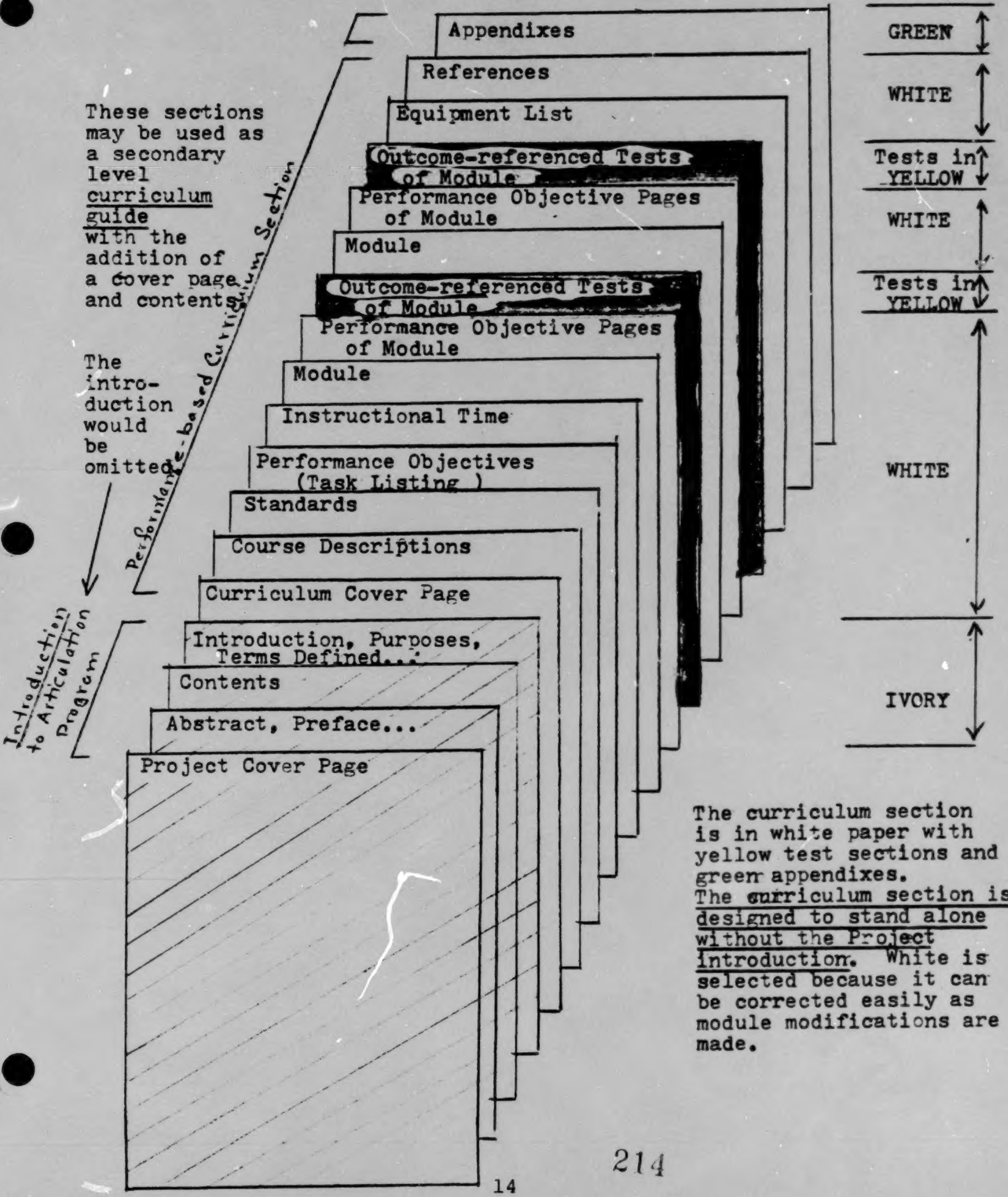
↓

PERIODIC REVIEW, TASK SURVEY WITH INDUSTRY, ETC., TO ENSURE VALIDITY OF ARTICULATED, PERFORMANCE-BASED INSTRUCTION GUIDES

(WS) = Workshop

Process design
by Wm. Edward Henderson Jr.
Revised May, 1983

BASIC ORGANIZATION OF ARTICULATED, PERFORMANCE-BASED INSTRUCTION GUIDE



Appendixes
References
Equipment List
Outcome-referenced Tests of Module
Performance Objective Pages of Module
Module
Outcome-referenced Tests of Module
Performance Objective Pages of Module
Module
Instructional Time
Performance Objectives (Task Listing)
Standards
Course Descriptions
Curriculum Cover Page
Introduction, Purposes, Terms Defined...
Contents
Abstract, Preface...
Project Cover Page
GREEN
WHITE
Tests in YELLOW
WHITE
Tests in YELLOW
WHITE
IVORY
Performance-based Curriculum Section
Introduction to Articulation Program

These sections may be used as a secondary level curriculum guide with the addition of a cover page and contents.

The introduction would be omitted.

The curriculum section is in white paper with yellow test sections and green appendixes. The curriculum section is designed to stand alone without the Project Introduction. White is selected because it can be corrected easily as module modifications are made.

IMPLEMENTATION PROCESS
TO ARTICULATE
"ONE" VOCATIONAL PROGRAM

1st YEAR	2nd YEAR	3rd YEAR	4th YEAR
Development	Field Trial Implementation	Full Implementation of Revised Guides	Continuation of Articulation
Task force committee organized. Task force committee meets regulary to draft articulation document. Articulated, performance-based instruction guide (description, objectives, standards, performance actions, and outcome-referenced tests) developed. NOTE: Depending on the vocational program and the CBVE curriculum development skills of the task force committee participants, it may be possible to complete an articulation guide to a stage which will allow "early" implementation during the first (development) year or it may require a two year period for guide development.	Using the articulated, performance-based instruction guide developed during the first year: implement (a) CBVE or lateral articulation at the secondary level and (b) vertical articulation. Field trial articulated instruction guide. Revise guide based upon field trial experiences. Initiate the collection of data for future validity and reliability study. Articulation guide should be reviewed by each (school level) vocational program "curriculum advisory committee". Curriculum research and document shared with curriculum research/resource centers (ERIC, etc.).	Continued implementation of articulated CBVE guide, preferably a revised edition. Second year that one "graduation class" of students has been educated by articulated CBVE guide (Class has had two full years (complete program) of articulated CBVE instruction.). Data collected from any "advanced placement" students at Greenville Technical College for validity and reliability study. Data collected from secondary program graduates currently employed in the "vocational field," which has been articulated.	Continue articulation process, revising guide to ensure validity of objectives, tests, etc., and to ensure that there is no unnecessary gap or overlap in secondary to post-secondary vocational education and that graduates are competent to successfully enter the job market in skilled employment. First opportunity to conduct validity/reliability study of graduates with two years of secondary education by articulated CBVE guide. First year of fully revised guide.
Guide developed	First year that guide is implemented at secondary level	First year that a secondary program graduate exposed to one year of articulated, CBVE enters post-secondary education or employment.	First year that a secondary graduate exposed to two years of articulated CBVE enters post-secondary training or employment.
1st YEAR	2nd YEAR	3rd YEAR	4th YEAR

TASK FORCE COMMITTEE OBJECTIVES

( ) DESCRIBE THE SECONDARY LEVEL VOCATIONAL TRAINING PROGRAM OBJECTIVES

---Begin with Task Analysis, as necessary.

( ) OUTLINE COURSE CONTENT

---This content outline will help determine the Modules of the training program.

( ) IDENTIFY "GIVEN" INFORMATION, CONDITIONS FOR TRAINING PROGRAM

( ) LIST MAJOR OBJECTIVES OF TRAINING PROGRAM: (TASK LISTING)

---Outline the objectives for each module of the training program.

( ) BREAKDOWN EACH OBJECTIVE INTO KEY PERFORMANCE ACTIONS (STEPS)

---Identify those performance actions (sets of actions, steps) necessary to accomplish the objective: These steps actually become sub-objectives.
---Assign (estimate) the instructional time necessary for the average student to master the objective. (For planning purposes.)
---Identify any technical related information or skills necessary for the individual to accomplish the objective. State previous knowledge or skills that must be used to accomplish the objective. List important data (reference information, standards...) applicable to accomplishing the objective.

( ) DEFINE PERFORMANCE STANDARDS

---Identify the performance expected and how the competency will be measured.

---Mention any conditions that will be acting on individual as competency is demonstrated!

( ) DEVELOP OUTCOME-REFERENCED TESTS

---Identify "sample" measures of knowledges/skills/attitudes essential for entry level employment success. Tests are based on objectives. The performance, conditions, and standards of a test should be the same as stated in the objective.

1983-1984, PHASE THREE, SCHEDULE OF ACTIVITIES

DATE	DEVELOPMENT SCHEDULE	AIR COND., HEATING & REFRIGERATION	AUTO BODY REPAIR	ELECTRICITY	MACHINE SHOP	MASONRY
JULY	Preliminary "Task Analysis"					
AUGUST	Task Analysis Results Conclude Task Analysis & Survey Instructors					
SEPTEMBER	Introductory WS, WS I, & WS II					
OCTOBER	Develop Task List					
NOVEMBER	Write Objectives					
DECEMBER	Complete Objectives & Write Actions					
JANUARY	Complete Actions & State Standards					
BRUARY	WS III & Develop Tests					
ARCH	Complete Tests					
PRIL	Review & Revise Draft					
MAY	Guides Completed & Final Typed					
JUNE	Reproduction & Distribution of Completed Guides					

"All programs to follow same schedule."

DEFINITIONS OF TERMS

The following definitions of terms are applicable to the articulated, performance-based instruction guides developed as products of the Occupational Education Articulation Program.

Behavior:	The actions of a person (specifically, job or job training actions). Behavioral actions include both overt, those that can be observed, and covert, those not observable outwardly. Performance may be interchanged with behavior in the project. (See also Performance Actions).
Concept:	A group of ideas that may be classed together or that are similar.
Criteria:	A standard by which performance may be measured, usually considered the minimum standard.
Domain:	A cluster of related jobs.
Duty:	One of the distinct major activities involved in the work performed and comprising related tasks.
Evaluation:	When comparison is made between a measurement and a standard and judgment is passed on the comparison.
Item:	A single stimulus or stimulus pattern that calls for a single response or set of responses. It is one sample of behavior or performance. The response may be simple or complex.
Job:	The duties or tasks actually performed by a specified individual.
Knowledge:	In this project, knowledge refers to acquired covert behavior which facilitates skills and performance, such as the theoretical information of what should be done under given circumstances, and in what order of sequence performance should occur to accomplish the objective.
Measurement:	The process of determining the extent some characteristic is associated with the student.
Module:	Modules in the pilot Drafting and Business and Office Education curriculum modifications in the Occuptional Education Articulation Program have been designed to

coincide secondary level training with post-secondary level similar areas of training.

Another method of developing modules might be for modules to represent an identifiable, complicated task or job area involving a number of sub-tasks such as "Electrical Systems" in Automotive Mechanics.

Norm-referenced Evaluation: In norm-referenced evaluation, measures are dependent on a relative standard. Measures compare the capabilities of one student to those of other students.

Objective: (See Performance Objective) A stated desired outcome of training or the end result of the job, task, or performance actions. Objectives referred to in this project will be terminal objectives, generally representing a specific job function.

Occupational Education: An organized sequence of learning experiences consisting of vocational theory, practice, and skills taught to students on a regular or systematic basis.*

*Reference: Standards of the Delegate Assembly (Atlanta: Southern Association of Colleges and Schools, Commission on Occupational Education, December, 1972) p. 12.

Outcome-referenced Evaluation: Outcome-referenced, or criterion-referenced, measurement provides a standard of achievement for the individual as compared with specific behavioral objectives and therefore provides information about the degree of competence attained by the student.

The outcome-referenced measure is a performance or other measure based upon a performance objective, the accomplishment of which measures attainment of that objective.

Performance: Performance is used in this project to refer to a job or task which results from a set of sequential actions or steps.

Performance Actions: A series of steps, generally arranged in a sequence ordinarily followed, which when completed may result in the accomplishment of a performance objective (performance of a task).

Performance actions may be referred to as a set or sets of skills, functions, or steps. V-TEC (Vocational-Technical Education Consortium of States) catalogs generally describe performance actions in the "performance guide" of their format.

Articulated, Performance-based Instruction Guide: A comprehensive collection of performance objectives, performance actions to obtain those objectives, suggested hours for instruction (for planning purposes), performance standards, related technical information, and outcome-referenced measures, as well as general secondary level and post-secondary level descriptions of similar courses for the purposes of aiding lateral and vertical articulation concerning the subject area.

Performance-based Instruction: Performance-based (competence-based) instruction is based on the competencies or tasks performed by on-the-job workers. Everything in a performance-based instruction system is made public beforehand. There are no surprises for student, teacher, counselor, or employer. When the student begins a program, information is available to tell the student exactly what competencies are expected to be developed as a result of the instructional program, how and against what standards or criteria the student will be evaluated, and how the student's competencies will be communicated to the student, instructors, and to employers. A performance-based instructional system tells the student exactly what the student must learn, teaches the student that skill or knowledge, and then tests on mastery of that specific competence.

Performance Objective: A statement in precise, measurable terms of a particular behavior to be exhibited by a learner under specified conditions. It possesses each of the elements or characteristics specified below:

Conditions under which the performance is to take place.

Behavior Desired or expected of the student (things to be done, the performance desired).

Standards to determine how well the performance is to be done (criteria).

Performance Test: A performance test requires the student to demonstrate (master) the desired behavior of the objective (accomplish a job-like task) under controlled conditions and according to predetermined standards. The controlled conditions allow the student to demonstrate the desired behavior and the conditions remain consistent from student to student.

Skill: Primarily, skill refers to overt, observable performance, however, it is recognized that there are covert skills required in some performances.

Step: Step is used to refer to a task or action, generally as a sequence of steps involved in the accomplishment of a performance objective or job.

Systems Approach: The systems approach to instruction emphasizes the specification of instructional objectives, precisely controlled learning experiences to achieve the objectives, criteria for performance, and evaluative information.

Task:	A task is a set of skills (set or sets of functions, actions, or steps) the student must perform to accomplish the job (training). A task may be described as a logically related set of actions necessary or required to complete the job objective. Several tasks could be referred to as a duty.
Task Analysis:	Task analysis is breaking down a learning task (objective) into component tasks each of which must be mastered as a prerequisite to mastery of the total job.
Task List:	A listing of tasks (performance objectives) performed by incumbent workers (students in training) within a domain of interest (course of study).
Test:	An event during which the student is asked to demonstrate some aspect of knowledge or skill is a test. It can be a single test item, but usually it consists of several items.

THE SCHOOL DISTRICT
OF GREENVILLE COUNTY

GREENVILLE TECHNICAL COLLEGE

TO: All Administrators, Staffs and Faculties, The School District of Greenville County and Greenville Technical College

SUBJECT: Application and Implementation of the Policies and Procedures for the Articulation of Similar Vocational Training Programs of Instruction

Since 1976, The School District of Greenville County and Greenville Technical College have been working toward making the articulation of vocational education programs a viable and valid reality. Through joint efforts in the Occupational Education Articulation Program, The School District of Greenville County and Greenville Technical College fully support the concept of articulation and agree upon the purposes of the articulation program.

This Policies and Procedures Guide has been developed as a joint effort of The School District of Greenville County and Greenville Technical College with the assistance of individuals representing the institutional administrative units, involved faculty, and the local business and industrial community. The Policies and Procedures Guide is designed to assist the articulation of very similar programs of vocational training between the secondary and post-secondary, public, vocational training institutions in Greenville County.

Appreciation is expressed to participants at both institutions for the joint effort of this endeavor.

J. F. Hall

Thomas E. Barton

J. F. Hall
Superintendent
The School District of
Greenville County

Thomas E. Barton
President
Greenville Technical College

TASK FORCE COMMITTEE
AGREEMENT TO ARTICULATE
VOCATIONAL EDUCATION

Articulation provides a system whereby secondary and post-secondary instructors can cooperate effectively in providing a continuous occupational development program where the level and type of vocational training that leads to entry-level employment skills will be clear to instructors, other educators, students, and potential employers.

The concept of articulation and the articulation program are supported fully be The School District of Greenville County and Greenville Technical College which have agreed upon a statement of purpose for the articulation of similar vocational education programs in Greenville County.

The articulation program in Greenville County is a joint effort of The School District of Greenville County and Greenville Technical College to develop a continuous program of vocational training so that students may continue their career preparation without loss of time or waste of effort in repeating tasks which have been learned previously and demonstrated. Articulation program activities are designed to help remove unnecessary gaps or overlap in student learning which may occur when a student completes a secondary vocational program and continues career development at the post-secondary level in a similar occupational field.

To implement articulation, instructor representatives from the participating institutions have met as a task force committee to develop this articulated, performance-based instruction guide which describes the secondary vocational program and which provides the parameters for vertical articulation.

Vertical articulation shall include recognition of the occupational competencies demonstrated by secondary graduates of articulated vocational programs.

It is agreed that...

The task force committee instructor representatives from The School District of Greenville County and Greenville Technical College mutually recognize the value of occupational education provided by each institution.

The task force committee instructor representatives will take the necessary actions, approved by their administrations, to ensure that this agreement to articulate is fulfilled including interpreting the program to students.

It is understood that periodic review of the articulated task objectives, performance actions, minimum standards, and outcome-referenced measures will be necessary to ensure that a valid training program is serving the needs of the community and the students.

Each task force committee participant hereby agrees to notify the others of any changes which modify the articulated, performance-based vocational program described in this guide so that each articulation guide, and where appropriate the articulation program, may be revised mutually so that articulated occupational training in Greenville County will conform to the minimum standards outlined in this guide.

This agreement to articulate establishes the necessary framework for lateral as well as vertical articulation.

AGREED UPON BY THE TASK FORCE COMMITTEE PARTICIPANTS ON THIS DAY,

____
date

Name	Institution/School

CURRICULUM ACTIVITIES/PRODUCTS

Occupational Education Articulation Program

AREAS ARTICULATED*
(1981-1982)

Drafting I
Typewriting I and II
Shorthand I and II
Accounting I and II
Office Procedures
Business English

AREAS ARTICULATED
(1982-1983)

Automotive Mechanics
Building Construction/Carpentry
Food Service-Commercial Cooking/Food Service Management
Welding
Drafting II

AREAS TO BE ARTICULATED
(1983-1984)

Air Conditioning and Refrigeration
Auto Body Repair
Electricity
Machine Shop
Masonry

*Articulated = Articulation, performance-based instruction (curriculum) guide written. Articulation process implemented.

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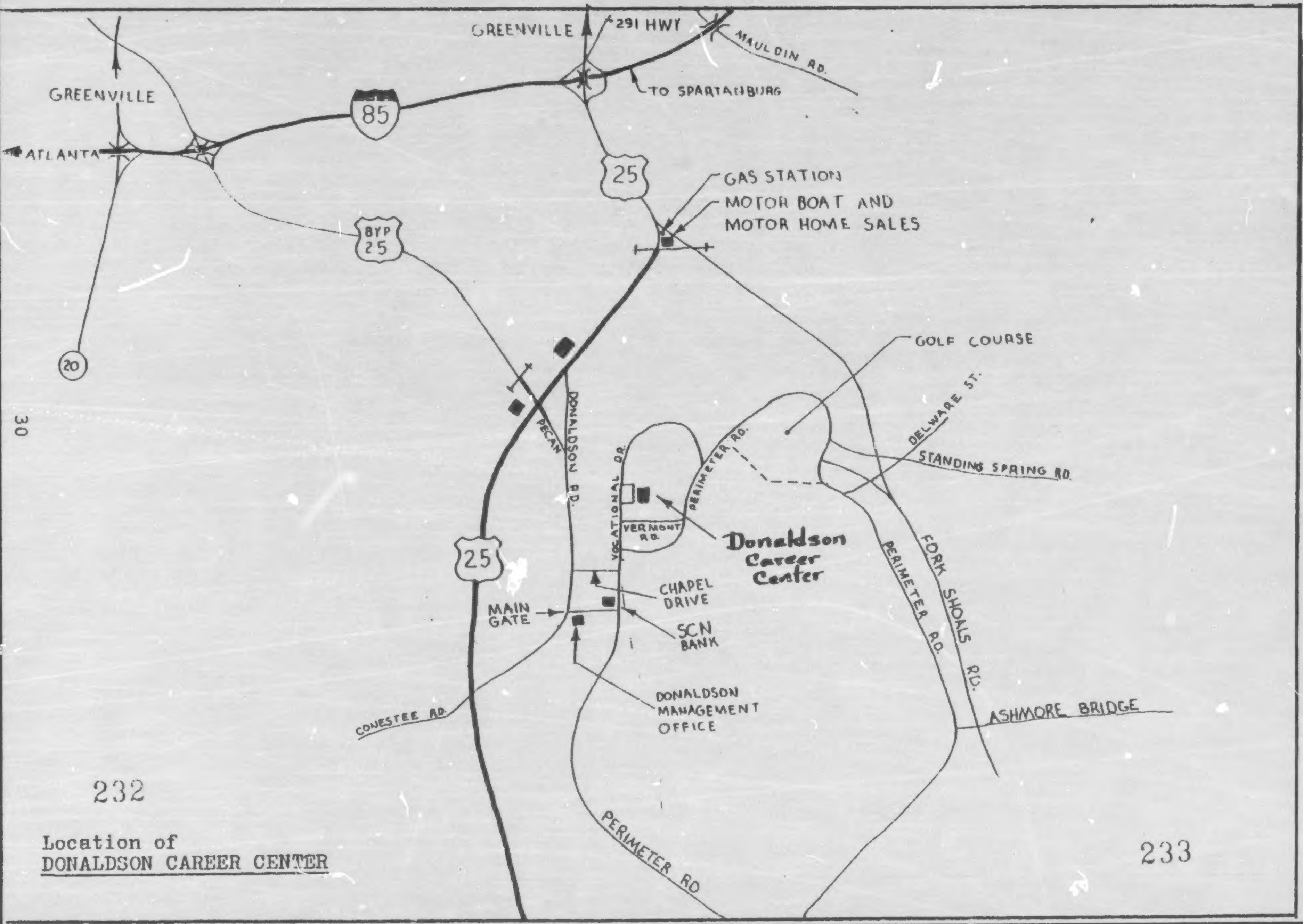
GREENVILLE
291 HWY
MAULDIN RD.
TO SPARTANBURG
GREENVILLE
85
ATLANTA
25
GAS STATION
MOTOR BOAT AND
MOTOR HOME SALES
BYP 25
20
GOLF COURSE
DELWARE ST.
STANDING SPRING RD.
DONALDSON RD.
PECAN
PERIMETER RD.
VOCATIONAL DR.
VERMONT RD.
Donaldson Career Center
25
CHAPEL DRIVE
MAIN GATE
SCN BANK
PERIMETER RD.
FORK SHOALS RD.
DONALDSON MANAGEMENT OFFICE
ASHMORE BRIDGE
CONESTEE RD.
PERIMETER RD

Location of
DONALDSON CAREER CENTER

WORKSHOP GUIDE I

SUGGESTIONS FOR CONDUCTING A TASK ANALYSIS AND SOME SOURCES OF READY-MADE TASK LISTS AND OBJECTIVES FOR CBVE

by

Wm. Edward Henderson Jr.

May, 1983

DISCRIMINATION PROHIBITED

Title VI of the Civil Rights Acts of 1964 states: "No person in the United States, shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefit of or be subjected to discrimination under any program or activity receiving federal financial assistance." The Occupational Education Articulation Program is operated in compliance with this law.

The opinions expressed herein do not necessarily reflect the position or policy of the funding or sponsoring organizations and no official endorsement by those organizations should be inferred.

BIAS STATEMENT

Articulated, performance-based instruction guides are developed based upon tasks (objectives) important to the success of entry level workers. The objectives are derived from task analysis and available tasks lists such as V-TEC Catalogs. Standards of performance are those expected by local businesses and industries for job success. Test samplas are included to represent valid and reliable measures of vocational competency.

Articulated, performance-based instruction documents are designed to comply with the requirements of PL 94-482 Educational Amendments of 1976, Title II, which is intended to "...ensure that...curricula do not reflect sterotypes based upon sex, race, or national origin..."

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Every effort has been made to appropriately document any copyrighted material used in this articulated, performance-based instruction document.

Many ideas and models, however, have evolved from years of research and experience and often are difficult to precisely credit.

The objectives and task actions of the articulated guides are developed or contributed by task force committee (instructor) participants based on their expertise and on task lists from resources such as V-TEC Catalogs. Standards included in guides are those identified by local potential employers as important to the success of entry level workers. Sample knowledge and performance tests are included to represent valid and reliable test items that may be used to measure mastery of objectives. Test samples taken from texts or workbooks typically are those being used locally and appropriate documentation has been included.

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1983

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PREFACE

The development process of the articulated, performance/competency-based instruction/curriculum guides is based on field-proven steps that, if followed, should result in the necessary information from which a practical, quality, state-of-the-art training description and curriculum guide may be written in a minimum time.

A premise of the development process is that it is absolutely essential that vocational education be based on the knowledges, skills, abilities, and personal characteristics important to success on the job, if the vocational education program is going to validly serve the needs of students and potential employers of the community.

Greenville, SC W. E. H.

SIMPLIFIED STEPS
OF THE DEVELOPMENT OF
ARTICULATED, PERFORMANCE-BASED INSTRUCTION GUIDES

DOCUMENT PRE-DEVELOPMENT ACTIVITIES

(WS) WORKSHOP TO ENSURE ALL TASK FORCE COMMITTEE PARTICIPANTS ENTER THE DEVELOPMENT PROCESS WITH A COMMON UNDERSTANDING OF THE PROGRAM, TASKS EXPECTED OF THEM, AND A COMMON LANGUAGE

↓

SURVEY SIMILARITIES OF SECONDARY AND POST-SECONDARY PROGRAMS

↓

DESCRIBE SECONDARY AND POST-SECONDARY SIMILAR PROGRAMS OF TRAINING: CURRICULUM AREAS TO BE DEVELOPED INTO COMPETENCY-BASED DESCRIPTION

↓

IDENTIFY STATE AND LOCAL EDUCATIONAL STANDARDS

↓

(WS) WORKSHOP PRECEEDS TASK ANALYSIS TO IDENTIFY PERFORMANCE EXPECTATIONS OF POTENTIAL EMPLOYERS

↓

INPUT FROM CURRICULUM ADVISORY COMMITTEES THROUGH INSTRUCTOR/INSTITUTIONAL PARTICIPANTS (SURVEYS AS NECESSARY)

↓

DOCUMENT DEVELOPMENT PROCESS

(WS) WORKSHOP ON WRITING OBJECTIVES, ACTIONS, AND STANDARDS

↓

DEVELOP VALID TASK LIST OF PERFORMANCE OBJECTIVES

↓

ARRANGE PERFORMANCE OBJECTIVES IN LEARNING SEQUENCE

↓

SEQUENCIAL LISTING OF PERFORMANCE ACTIONS TO REACH OBJECTIVES

↓

IDENTIFY PERFORMANCE STANDARDS FOR TASK COMPETENCY

↓

IDENTIFY "SUGGESTED INSTRUCTIONAL TIMES" FOR PLANNING PURPOSES

↓

IDENTIFY RELATED TECHNICAL INFORMATION FOR EACH OBJECTIVE

↓

REVIEW OF OBJECTIVES, ACTIONS, AND STANDARDS BY CURRICULUM ADVISORY COMMITTEES THROUGH TASK FORCE COMMITTEE PARTICIPANTS

↓

(WS) WORKSHOP PRECEEDS DEVELOPMENT OF OUTCOME-REFERENCED TEST SAMPLES

↓

REVIEW TEST ITEMS AGAINST OBJECTIVES TO ENSURE THERE IS AGREEMENT IN CONDITION, PERFORMANCE, AND STANDARDS

↓

SUMMARIZED INSTRUCTIONAL TIME ESTIMATES AND ADJUST TO EQUAL PROGRAM REQUIREMENTS

↓

LIST MINIMUM TRAINING EQUIPMENT

↓

DEVELOP STATE-OF-THE-ART BIBLIOGRAPHY

↓

IDENTIFY AND DEVELOP APPENDIXES

↓

POST-DEVELOPMENT PROCESS

MUTUAL AGREEMENT (SIGNED BY INSTRUCTOR PARTICIPANTS) CONCERNING ARTICULATION DOCUMENTS

↓

(WS) ORIENTATION WORKSHOP TO EXIT DEVELOPMENT PROCESS: SUMMARIZE ARTICULATION PROGRAM AND COMPETENCY-BASED INSTRUCTION TO ALL TEACHER PARTICIPANTS

↓

FIELD TRIAL IMPLEMENTATION, VALIDATION STUDY

↓

CORRECTIONS, REVISIONS, AND MODIFICATIONS BASED ON FIELD TRIAL FINDINGS

↓

FULL IMPLEMENTATION OF GUIDES

↓

PERIODIC REVIEW, TASK SURVEY WITH INDUSTRY, ETC., TO ENSURE VALIDITY OF ARTICULATED, PERFORMANCE-BASED INSTRUCTION GUIDES

(WS) = Workshop

Process design
by Wm. Edward Henderson Jr.
Revised May, 1983

PART I

INTRODUCTION TO TASK ANALYSIS

TASK: DEFINED

A task is a set of skills (set or sets of functions, actions, or steps) the worker (student) must perform to successfully accomplish the job (training objective). A task may be described as a logically related set of actions necessary or required to complete the job objective.

TASK ANALYSIS: DEFINED

Task analysis, one "...of the better by-products of the programmed learning movement..." (25-3, Saltzman, Maly, and Hartshorn, "Vocational and Technical Education," Training & Development Handbook), is defined by George S. Odiorne (151, Training by Objectives) as "a very detailed and specific spelling out in behavioral terms of the present behavior and desired behavior."

In Job Analysis, Job Specifications, and Job Descriptions (1) job (task) analysis is described as a "method to survey the detailed tasks, duties, relationships, and requirements of a job." In accomplishing this survey, job analysis typically answers questions in four areas (3-5):

1. Physical and mental tasks of the worker,
2. Methods, machinery, or equipment used to the job,
3. Purposes and responsibilities of the job which describe why the job is done, and
4. Knowledges, skills, and personal characteristics required by the worker to do the job.

Task analysis should be described in terms of the job requirements rather than describing what the worker is doing on the job.

Odiorne (154) suggests that "one task analysis can serve for hundreds of students" if the training objectives have been defined adequately and if the training program has been validated as an effective method of reaching the training objectives.

In the analysis, some competencies identified will be basic to the occupational field while other tasks or performance actions may be identified as essential to success in local employment. Typically, basic skills and knowledges to the occupation will be introduced early in the vocational program while others may be learned when required in the sequence of instruction. Competencies, generally, will be arranged and taught in a sequential development from easier tasks to more difficult tasks. The task analysis should be conducted so that major competencies may classified easily into a sequence based on difficulty of accomplishment.

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TASK ANALYSIS PROCESS

The task analysis survey should be done carefully and preferably over a period of several observations objectively recorded to identify the performance in question.

The task descriptions need not be written out in complete sentences since a few words may be used to adequately describe the job requirements.

Rummler (14-10, 12, "The Performance Audit, Training & Development Handbook) suggests the following sequence to accomplish the task analysis process.

1. Identify job functions being analyzed.
2. Identify potential employer's expectations of vocational program graduate's skills, knowledges, and attitudes.
3. Identify current performance objectives (knowledges, skills, and attitudinal).
4. Identify actual performance being demonstrated by graduates of the vocational program (on the job).
5. Identify and analyze any discrepancy between what is desired by potential employers and what actually is being demonstrated by graduates.

NOTE: If performance discrepancies are noted, it should be determined prior to analysing the performance situation if the performance discrepancies are not the result of enforcement of the work situation itself. It should be determined that any discrepancies are the result of workers not "knowing how" or not being able to perform. (152, Odiorne)

a. If a discrepancy is identified, determine that it is caused by the vocational program graduate not "knowing how" or not being able to perform.

b. Determine the value of correcting the discrepancy.

c. If the discrepancy is to be corrected, identify the cause.

Causes of Performance Deficiencies

(1) Knowledge Deficiencies: Graduate does not know...
    (a) ..."what to do"
    (b) ..."how to do it"
    (c) ..."when to do it"

(2) Execution Deficiencies: Graduate..."fails to perform because of factors in the work environment" such as:
    (a) "poor feedback" concerning how to improve performance
    (b) lack of positive reinforcement
    (c) poor or inappropriate job system design

> NOTE: A study of job communications, relationships, functions, management, or supervision may be required to determine the cause of execution deficiencies.

6. Determine necessary modifications to vocational program objectives, competency standards, or to the vocational program process or design.

Odiorne (151-159) suggests that the task analysis process should accomplish the following:

1. Identify the behavior change area.
2. Describe the student to be trained.
3. Identify the present performance level.
4. Identify the desired level of performance.
5. Describe the end result of a successful training program.
6. Identify what would indicate when performance will change from the present condition to the desired condition.

IMPORTANCE OF TASK ANALYSIS IN THE ARTICULATION PROGRAM

The articulated, performance-based instruction guides are designed to answer three critical questions necessary for quality vocational education. First, what should be taught? Second, how should it be taught? Third, how should students be evaluated?

The process of task analysis can help provide the answers to the question, "What should be taught?"

Qualitatively, the vocational education program should provide a suitable bridge between the career orientation and exploration goals of the earlier grade levels and the competency requirements of the job market.

The vocational education program content should be directly related to the requirements of adult life. The vocational program graduate should have gained the minimum competencies needed for successful entry into and performance in a chosen occupation.

Task analysis in this vocational articulation program identified the essential knowledges, skills, and attitudes that employers say are important for entry level job success.

By using the same core of vocational program task objectives, similar secondary and post-secondary vocational programs may be articulated to reduce unnecessary duplication and so that a vocational education continuum may be realized.

PURPOSE OF TASK ANALYSIS IN THE ARTICULATION PROGRAM

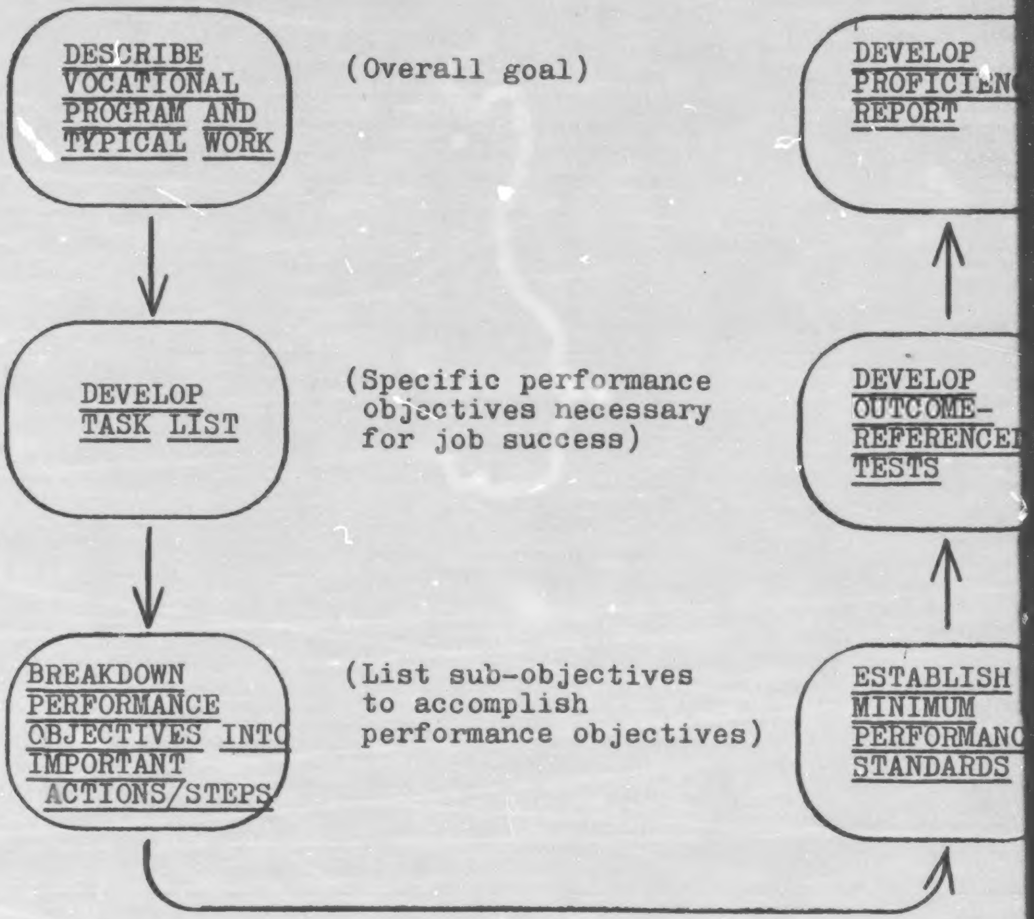
The purpose of vocational training by articulated objectives, which are developed in part based on task analysis, is to prepare graduates for successful entry into the performance in a skilled occupation.

Task analysis should help ensure that no one textbook is relied upon to determine the course content of a vocational education program. Task analysis will be used to help formulate detailed behavioral statements of the knowledges, skills, and personal characteristics that potential employers say an employee should be able to demonstrate to get a job done.

Task analysis will be used to break down the major performance objectives of a job (vocational education program) into component tasks (performance actions) each of which must be mastered as a prerequisite to job (vocational) competency. Task analysis will be used also to determine performance standards necessary to successful completion of the job (training program).

FLOWCHART OF ARTICULATED, PERFORMANCE-BASED INSTRUCTION GUIDE DE

Figure 1


DESCRIBE VOCATIONAL PROGRAM AND TYPICAL WORK
DEVELOP TASK LIST
BREAKDOWN PERFORMANCE OBJECTIVES INTO IMPORTANT ACTIONS/STEPS
ESTABLISH MINIMUM PERFORMANC STANDARDS
DEVELOP OUTCOME-REFERENCE TESTS
DEVELOP PROFICIENC REPORT

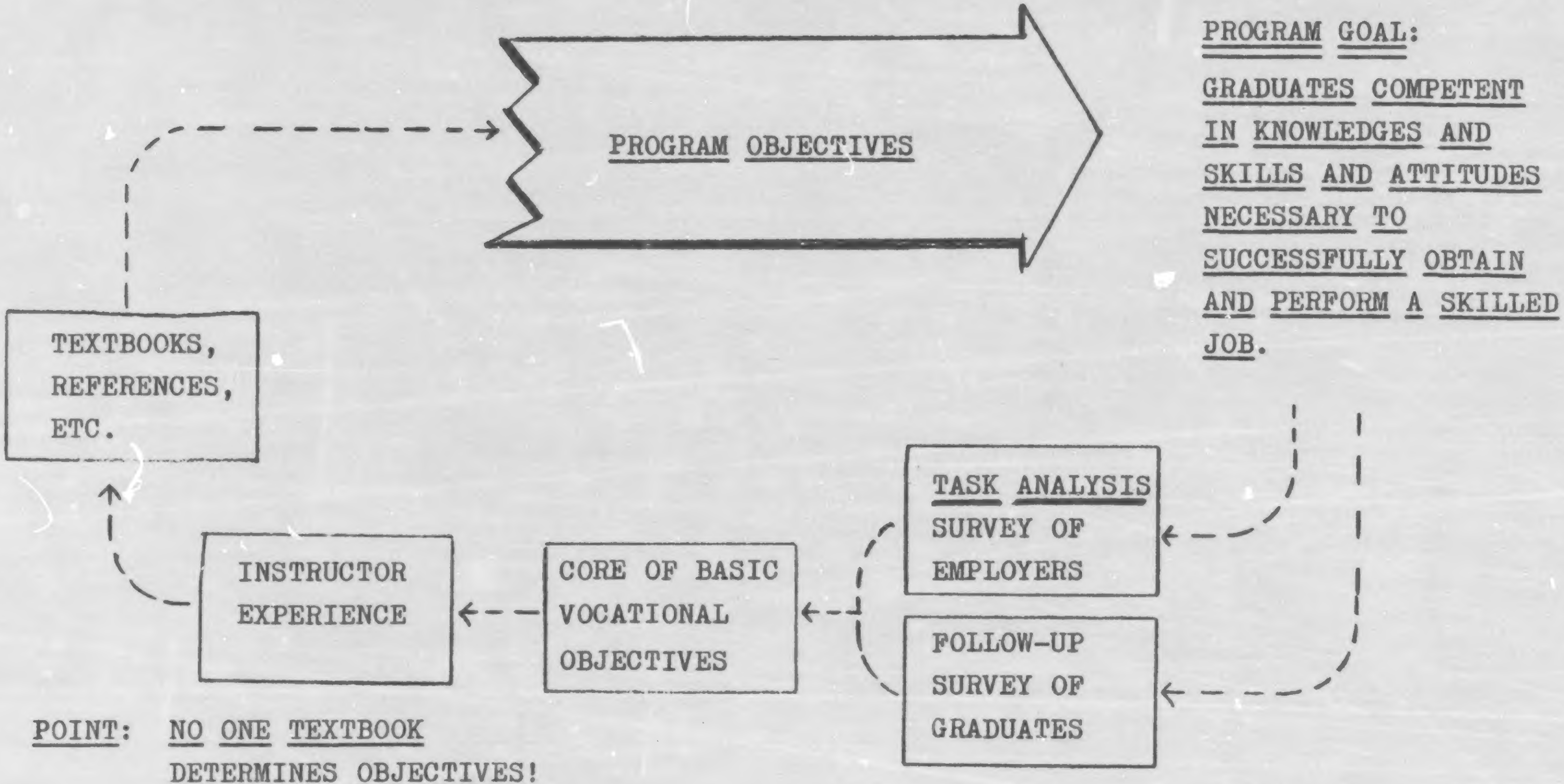
(Overall goal)

(Specific performance objectives necessary for job success)

(List sub-objectives to accomplish performance objectives)

Concept by
Wm. Edward Henderson Jr.
1981

WHERE PERFORMANCE OBJECTIVES SHOULD ORIGINATE


PROGRAM OBJECTIVES
TEXTBOOKS, REFERENCES, ETC.
INSTRUCTOR EXPERIENCE
CORE OF BASIC VOCATIONAL OBJECTIVES
TASK ANALYSIS SURVEY OF EMPLOYERS
FOLLOW-UP SURVEY OF GRADUATES

PROGRAM GOAL: GRADUATES COMPETENT IN KNOWLEDGES AND SKILLS AND ATTITUDES NECESSARY TO SUCCESSFULLY OBTAIN AND PERFORM A SKILLED JOB.

POINT: NO ONE TEXTBOOK DETERMINES OBJECTIVES!

Figure 2

PART II

SUGGESTIONS FOR CONDUCTING TASK ANALYSIS

PREPARATION FOR TASK ANALYSIS

A first step in organizing for the task analysis is to determine the essential information needed. A survey of current information should help determine the status of the current vocational education program, help establish any core vocational skills and knowledges that may be omitted from the task analysis survey, and should identify areas where additional data is needed concerning objectives, performance actions, standards, and competency testing.

By accomplishing this preparatory step, the surveyor (instructor, curriculum developer) should enter the task analysis process with a repertoire of data in the field and should be able to reduce a duplication of data collection.

As a starting point, the surveyor might review or consult the following data sources:

- Currently used curriculum descriptions and guides
- Currently used textbooks, workbooks, testbooks, and reference books (Note: These may be out of date if several years old.)
- Recently published textbooks, workbooks, testbooks, how-to-do-it publications, reference books, etc.
- Dictionary of Occupational Titles, Occupational Outlook Handbook
- Follow-up studies of vocational program graduates
- South Carolina Employment Securities Commission projections and studies
- V-TEC Catalogs
- Task lists, competency-based descriptions, standards, and criterion-referenced tests developed by others for the vocational field
- Trade association, union, and professional society information
- Federal, State, and municipal government publications related to the occupational field, including military publications
- Job descriptions or existing job analysis
- Vocational instructors in the field, regardless of experience
- Curriculum advisory committees

To identify available information concerning the vocational field, a preliminary survey of respositories and resources should include at a minimum the following:

- Thesaurus of ERIC Descriptors to identify key descriptors
- Recourse in Education for documents on subject...note ED Accession numbers
- Current Index to Journals in Education for periodical literature

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- Consider a "computer search" by ERIC (recommended)
- Note: By using microfiche rather than paper copies of ERIC documents, library/research funds may be extended considerably and filing may be more efficient and require less space.
- Southeastern Curriculum Coordination Network
- State V-TEC Technical Coordinator
- Back issues of OPEN ENTRIES, A Competency-based Vocational Information Exchange, Flordia State University (recommended)

Initially, to generate a basis for task analysis, task force committee participants may start by converting existing task inventories or lists and competency profiles to possible task lists which may be critiqued by curriculum advisory committees or from which a core of tasks may be developed.

By following these suggestions to prepare for a task analysis, the proper groundwork would be established from which a task analysis could be developed successfully.

ORGANIZING FOR A TASK ANALYSIS

At this point, the curriculum developer/surveyor should be reasonably organized to identify major task areas prior to conducting the "field task analysis" with potential employers. Prepared "task analysis" worksheets and a preliminary task list should be used to ensure that the maximum amount of data is collected in the minimum time. Potential employers participating in the task analysis process should exit from the experience with a positive impression of the process and what will result from their input.

Potential employers should be identified through vocational placement offices as those Job Placement officers with vocational career/education centers should be contacted to identify potential employers.

Potential employer participants in task analysis should be selected considering the recommendations of career/vocational center Job Placement Coordinators and instructor task force committee participants.

USING THE INTERVIEW PROCESS

Considerable data may be collected by the experienced trainer/writer/interviewer from observations of graduates or workers performing job tasks and from interviews with graduates/workers and managers.

Date collection should evolve from observation into the interview process. The typical interview might begin as questions asked of the graduate/worker, possibly about observations made by the interviewer. Emphasis must remain on identifying the essential information about job tasks and obtaining that information as efficiently and objectively as possible.

STRUCTURING THE TASK ANALYSIS

The task analysis should be designed and conducted for the purpose of obtaining the following minimum information concerning job tasks.

1. Task
2. Competency standards
3. a. Required Knowledge
   b. Required Skill
4. Related technical information necessary to complete the task
5. Possibly the "worker function level" to indicate the level of complexity of the job
6. Minimum educational requirements such as reading level, mathematical skills, etc.
7. Possibly the typical time required for an entry-level worker to do the job

TASK ANALYSIS SURVEY FORMS

Enclosed (Form 1) is a sample Task Analysis Worksheet that might be used to describe a job task.

Accompanying the blank Task Analysis Worksheet is a sample completed form for illustration purposes.

WORKER FUNCTION LEVEL

The worker functions in a set of job task that involves "to some degree a relationship on the part of the worker to data, people, and things." (4, Handbooks for Analyzing Jobs)

DATA	PEOPLE	THINGS
Synthesizing	Mentoring	Setting Up
Coordinating	Negotiating	Precision Working
Analyzing	Instructing	Operating-Controlling*
Compiling	Supervising	Driving-Operating*
Computing	Diverting	Manipulating
Copying	Persuading	Tending
Comparing	Speaking-Signaling*	Feeding-Offbearing*
	Serving	Handling
	Taking Instructions-Helping*	

*single functions

Handbook for Analyzing Jobs, p. 5

A percentage rating may be given to the relationship of worker functions or comments may be made.

MINIMUM EDUCATIONAL REQUIREMENTS

Some job tasks require specific reasoning ability, math or language skills. Required reading levels (for example, many automotive shop manuals are written at the 11th to 12th grade levels) should be indicated.

TASK NO.

Assigning a task numbering system will help keep task descriptions organized.

Suggestions:

05.09 02

Unit, Module — 05
Task Objective — 09
Action, Step — 02

TASK ANALYSIS
WORKSHEET

OCCUPATIONAL AREA:

GOAL:

OBJECTIVE:

"TO DO THIS TASK"

TASK:

TASK NO#

WORKER FUNCTION LEVEL *See instructions			MINIMUM EDUCATIONAL REQUIREMENTS		
Data	People	Things	Reasoning	Math	Language

"TO THESE STANDARDS"

DESCRIPTIVE:

NUMERICAL:

"THE GRADUATE NEEDS THIS KNOWLEDGE & SKILL TRAINING"

FUNCTIONAL:

SPECIFIC:

"AND SHOULD KNOW THIS RELATED TECHNICAL INFORMATION"

See instructions

Form 1

ILLUSTRATION/INSTRUCTIONS
SAMPLE

Some task will be easy to describes others may be difficult to clarify.

TASK ANALYSIS
WORKSHEET

OCCUPATIONAL AREA: Automotive Mechanics (D.O.T. 620.281)

GOAL: Inspects, services, maintains, and repairs automotive emission control systems...

OBJECTIVE: Removes and replaces catalytic converter on automobile emission controls and exhause system

"TO DO THIS TASK"

TASK: TASK NO# 05.09

Inspects catalytic converter for operation

Replaces catalytic converter following manufacturer's shop manual

(Note: Some catalytic converters may be drained and pellets raplaced instead of replacing catalytic converter unit.)*

WORKER FUNCTION LEVEL *See instructions			MINIMUM EDUCATIONAL REQUIREMENTS		
Data	People	Things	Reasoning	Math	Language
20%	5%	80%	discriminate systems*	10th to follow manual	---

"TO THESE STANDARDS"

DESCRIPTIVE:

What speed? accuracy? format? procedure?

Remove catalytic converter

(or replace converter pellets if required...)*

Discriminate between systems to remove and replace

NUMERICAL:

How many? In what time? Corrections or omissions or errors

Manufacturer's specifications

(takes about 1½ hours to accomplish...)

"THE GRADUATE NEEDS THIS KNOWLEDGE & SKILL TRAINING"

FUNCTIONAL:

How to?

Inspect system

Use necessary test equipment

Read and follow manufacurer's shop manual, interpret specifications

Observe safety procedures

SPECIFIC:

Use of hand and power tools or special tools

How? when? where?

"AND SHOULD KNOW THIS RELATED TECHNICAL INFORMATION"

Detection of exhaust system leaks
Use of exhaust gas analyzer
Safety in working with exhaust system and catalytic converters
Shop safety

See instructions

SAMPLE FORMS USED IN THE ARTICULATION PROGRAM

Enclosed are samples of 8 1/2" x 14" forms that have been used to collect task analysis information in the Occupational Education Articulation Program. The long forms provide ample space to record information and the format allows a clerical assistant to transfer the information into a prepared format with a minimum of effort.

Form 2 Given Information - Identifies general information concerning the vocational program or job area

Form 3 Environment Conditions & Physical Demands - Identified important situational conditions or worker demands that may be considered in describing training

Form 4 Module Standards - Identified standards or competencies that are applicable to the occupational field, probably to a number of tasks

Form 5 Task List - A summary sheet for task objectives

Form 6 Performance Objectives Worksheet - The primary form used to describe the job tasks, break the task down into performance actions or steps, and state essential information

Form samples 2-6 provide the necessary guide from which an articulated, performance-based instruction guide may be developed. Using the form helps keep the activities of the task force committee on track and enables the information to be easily recorded, filed, and used.

Module No. ______ Title ________________________________

GIVEN INFORMATION

Necessary machines, tools, equipment, training aids:

Materials, products, subject matter, services:

Requirements/limitations on student (Worker):

Related technical information the worker (student) must know to be able to perform the task:

Instructional texts or references:

Form 2

Module No. ____________ Title ______________________________

ENVIRONMENTAL CONDITIONS

1. Environmental:
   Inside ____%
   Outside ____%

   Teamwork ____%
   Proximity ____%
   Isolation ____%

2. Extreme cold with or without temperature changes

3. Extreme heat with or without temperature changes

4. Wet or humid

5. Noise

6. Vibration

7. Hazards:
   Mechanical
   Electrical
   Burns
   Explosives
   Radiant Energy
   Other

8. Atmospheric conditions:
   Fumes
   Odors
   Dusts
   Mists
   Gases
   Poor Ventilation
   Other

PHYSICAL DEMANDS

1. Strength, lifting, carrying, pushing, or pulling:
   Sedentary work
   Light work
   Medium work
   Heavy work
   Very heavy work

2. Climbing or balancing

3. Stooping, kneeling, crouching, or crawling

4. Reaching, handling, fingering, or feeling

5. Talking or hearing

6. Seeing

Form 3

Module No. ______ Title ______________________________

MODULE STANDARDS

(Standards that are in effect for the entire module and that are not optional. Standards applicable only to a particular set of tasks or functions should be described on the Performance Standards page.)

Form 4

TASK LISTING

for ____________

The Task Listing is a statement of each major task or Objective to be performed by the worker (or student) in the job areas (course of training).

For example: In Automotive Mechanics, a module of study might include Engine Tune-Up. Within that module, the worker might be expected to "Perform minor tune-up..." That is the objective. To accomplish that objectives will require going through a sequence of steps such as servicing/replacing spark plugs, replacing ignition points and condenser, etc.

The objective statement should include given information, the conditions under which the worker (student) will perform, the performance expected, and the standards for measuring competency (accomplishment of the job).

No. Performance Objective Statement (1-2 sentences preferred)	Frequency that average worker will be required to perform task				Level of difficulty: Normally performed skill level or levels checked			
	Daily	Weekly	Monthly	Periodically	Easy	Moderate	Difficult	Very difficult

PERFORMANCE OBJECTIVE WORKSHEET, PAGE NO. ___

MODULE .0 TITLE ______________________________

TASK . ____ TITLE ______________________________

PERFORMANCE OBJECTIVE: (Include given conditions, behavior desired, and standards to determine competency)

PERFORMANCE ACTIONS: (Actions, steps, etc., to reach objective)

PERFORMANCE STANDARDS: (Statement or statements of expected performance standards to determine competency)

SUGGESTED INSTRUCTION TIME: ____ Hours

RELATED TECHNICAL INFORMATION: (Information student should know to accomplish objective or helpful or reference information)

CHECKLIST FOR OBJECTIVE OR PERFORMANCE ACTIONS (If applicable):

Form 6

TEXTS AND REFERENCES USED FOR OBJECTIVES, STANDARDS, TESTS, OR LEARNING ACTIVITIES

Please list the following information about each text or reference publication used in your vocational program.

Example:	(one author)	Gagne' R. M., The Conditions of Learning, NY: Holt, Rinehart, & Winston, Inc., 1965.
	(several authors)	Mager, Robert F., and Peter Pipe, Analyzing Performance Problems, Belmont, CA: Fearson Pitman Publishers, Inc., 1970.
	(editor publication)	Bloom, Benjamin S., (Ed.), Taxonomy of Educational Objectives, NY: David McKay, Inc., 1956.
	(no author)	Climate for Articulation, Columbia, SC: South Carolina Advisory Council on Vocational and Technical Education, 1979.
	(article in magazine)	Eiss, Albert F., "Performance Objectives," NSSSP Bulletin, V 54, No. 352 (January, 1970), pp. 51-57.

Author(s)	Title	City/State of Publication	Publisher	Date

Appendix to Task Analysis

PART III

SAMPLE USE OF TASK ANALYSIS INFORMATION

The enclosed pages from the Articulated, Performance-based Instruction Guide for Welding illustrates how task analysis information is used to develop a vocational program description, standards, a task list, and, ultimately, a complete task objective description.

Sample page	Illustration
20-22	Welding Program Description
23	Oxyacetylene Welding Unit Description
24	Standards
25-27	Oxyacetylene Welding - Task List
28	Task Performance Objectives Page

WELDING I

LEVEL: Secondary

TITLE: Welding I

DESIGNATION: WELDING I COMPUTER NUMBER: 773

DESCRIPTION: Welding is designed to qualify students with the knowledge and skills necessary for successful entry level employment in the welding field. Welding instruction includes blueprint reading, characteristics of various metals, and methods of testing welds. Laboratory demonstrations and experience include both arc welding and gas welding practices. Cutting, brazing special welding processes, and safety are taught also.

OBJECTIVES: Plans a sequence of welding operations, select equipment to be used or parts of metal involved to accomplish a job.

Inspects welds and tests welded joints of work in progress and of completed work for visible defects, correct dimensions, joint strength, bead, weld penetration, and conformance to specifications, applying knowledge of geometry, welding principles, and physical properties of metals.

Connects hose from hand torch to oxygen and fuel tanks, or connects cables from power source to electrode holder to set up welding equipment.

Adjust valves on gas tanks to start flow of gases in hand torch, and adjusts mixture and pressure of gas welding equipment to obtain flame of desired size and color to weld metal parts.

Uses arc or flame cutting to cut metal plates and structure shapes from metal stock.

PERFORMANCE EVALUATION: Given basic welding tools and equipment, the necessary specifications, sketches, or blueprints, the student will demonstrate mastery of welding equipment, tools, and operations to produce acceptable metal products or make repairs.

Through outcome-referenced measures, the student will demonstrate competency in knowledge and skills necessary to successfully enter welding employment or to qualify for further advanced training such as in pipe welding at the post-secondary level.

JOB QUALIFICATION: Welders are qualified to read and interpret blueprints and drawings, to plan a sequence of operations, select the necessary equipment and materials, and apply simple mathematics to produce welded products or make welded repairs.

Welders apply heat from gas or electric sources to melt metal pieces to form a permanent bond with or without the use of filler metal.

Welders may use oxyacetylene or arc cutting to trim metal to desired sizes or shapes.

A combination welder can perform both electric and gas welding, according to layouts or work orders. Combination welders fabricate metal products, repair broken or cracked metal parts, fill or increase the size of metal parts.

Typical D.O.T. classifications for welding are:

Welder, Combination	812.884-014
Welder, Combination Apprentice	812.884-010
Welder, Production Line	812.884-018
Welder, Repair	812.884-022

Welder, Arc D.O.T. 810.884, T.E.A. 17.23 32
Welder, Gas D.O.T. 811.884, T.E.A. 17.23 32

WORKING CONDITIONS: Welding involves manual dexterity, welding requires good hand coordination and the ability to concentrate on detailed work for a long period of time. Welders may have to lift moderate weights of metal or equipment in their work of may have to stoop and work in a crouched position for long periods.

Some disadvantages found in welding work are occasional burns from welding sparks, exposure to fumes from molten metals, noxious or offensive odors, and work in outside cold or enclosed hot environments.

Welders must use protective equipment and safety procedures to avoid serious burns, injuries to the eyes, and explosions.

PREREQUISITES: None

For optimum success, welders should have manual dexterity, eye-hand coordination, color discrimination, and be in good physical condition. Some proficiency in mathematics and mechanical drawing would be helpful.
Suggested Grade Level: 11

REQUIRED/SUGGESTED INSTRUCTIONAL HOURS:

System	Year		
Division	Class	Lab	Total
Credits	3	-	3
Hours	540	-	540

LEVEL: Secondary

TITLE: Welding II

DESIGNATION: WELDING II COMPUTER NUMBER: 774

DESCRIPTION: Welding II is a continuation of training and reviews, expands, and applies those principles learned in Welding I.

OBJECTIVES: Same objectives as Welding I. Performs welding practices with greater knowledge and skill.

PREREQUISITES: Welding I

Suggested Grade Level: 12

REQUIRED/SUGGESTED INSTRUCTIONAL HOURS:

System	Year		
Division	Class	Lab	Total
Credits	3	-	3
Hours	540	-	540

OXYACETYLENE WELDING, CUTTING, AND BRAZING

PREREQUISITES: None

OBJECTIVES: The objective of oxyacetylene welding, cutting, and brazing (OAW) is to develop entry level skills for the following classifications of welders.

- Welder, Gas (DOT 811.684-014)
- Welder, Gas and Brazer Assembler portions of Combination Welder (DOT 819.384-010)
- Brazer, Production Line and Gas Welders, Production Line (DOT 819.684-010)
- Brazer, Assembler (DOT 813.684-010)
- Thermal Cutter, Hand (DOT 816.464-010)

Oxyacetylene, welding, cutting, and brazing training develops the skills necessary to produce high quality single and multi-pass welds on mild steel plate and pipe in the flat, horizontal, vertical, and overhead positions. The welder is trained to produce high quality flame cutting through the use of manual and machine operated flame cutting equipment. Skill at producing high quality brazed joint on mild steel.

Upon completing secondary training, the student should be skilled to set up OAW equipment and perform the industrial requirements of OAW welding, cutting, and brazing.

Unit No. 4.0 Title: OXYACETYLENE CUTTING/WELDING

MODULE STANDARDS

(Standards that are in effect for the entire module and that are not optional. Standards applicable only to a particular set of tasks or functions will be described on the Performance Standards page.)

1. Select tip.
    a. Proper size for work to be done (thickness of metal).
2. Inspect tip for signs of damage or flaws that could create a hazard or impair performance.
    a. Seat area: Smooth and clean to ensure good metal seal with torch head.
    b. Cutting oxygen orifice: Free of slag or spatter or other obstruction that may deform oxygen stream and render a poor quality cut.
    c. Pre-heat flame orifices: Free of obstruction. (Clogged or obstructed orifices will extend required pre-heat time and result in poor performance and cutting efficiency.
    d. O-Rings: Check for deterioation.
3. Install tip.
4. Set gas pressures for desired working pressure.

TASK LISTINGS
WELDING I
OXYACETYLENE

UNIT/TASK DESCRIPTION

Unit 4.0

4.01 (Oxyacetylene Cutting/Welding Terminology) Given proper instructions, identify standard oxyacetylene cutting/welding terms, typically used in daily operations, on a written test with 80 percent accuracy. Use standard oxyacetylene cutting/welding terminology upon completion of the training module to the standards of the instructor.

Terms and definitions adapted from: *Welding, Cutting & Heating Guide*, Denton, TX: Victor Equipment Co., pp. 54-57, 1977.

4.02 (Oxyacetylene Cutting/Welding Safety) Given proper instructions concerning oxyacetylene cutting/welding safety; demonstrate proper use of protective clothing and equipment to protect against hazards in gas cutting/welding with 100 percent accuracy.

4.03 (Perform Soap and Water Test [Safety]) Given oxyacetylene cutting/welding equipment to be tested for leaks, neutral soap and water, and proper instruction; perform a soap and water leak test. Mark (with tape, etc.) all discovered leaks for repair. Hoses and torch will not leak after repair and test.

4.04 (Identifying Oxygen and Acetylene Gases and Cylinder Handling) Given proper instructions and demonstration, identify with 100 percent accuracy characteristics of oxygen and acetylene gases and demonstrate proper handling of cylinders to the standards of the instructor.

4.05 (Set Up Oxyacetylene Cutting/Welding Station) Given oxyacetylene torch, regulators, hoses, check valves, cylinder wrench, oxygen, and fuel cylinders and portable cart; set up a portable or stationary oxyacetylene cutting/welding station. The oxy-fuel equipment will not leak and will operate safely as the manufacturer intended.

4.06 (Clean Oxyacetylene Cutting/Welding Tips) Given oxyacetylene cutting/welding equipment, tip cleaners, and instructions; clean both cutting/welding tips.

(NOTE: This objective will become standard practice when using oxyacetylene welding and cutting equipment.)

4.07 (Lighting The Torch) Given oxyacetylene cutting/welding equipment, striker, sample metal to be used in job; light torch (for cutting).

(NOTE: Tasks of (a) lighting the torch and (b) adjusting the flame typically will be accomplished as a continuing action.)

4.08 (Adjusting Flame) Given oxyacetylene cutting/welding equipment including striker, adjust flame for job.

(NOTE: Tasks of (a) lighting torch and (b) adjusting flame typically will be accomplished as a continuous action.)

4.09 (Oxyacetylene Cutting) Given oxyacetylene cutting equipment, set up the equipment for a cutting job, and cut given thin and thick steel according to instructor's assignment.

4.10 (Preparing the Joint) Given metal to clean and prepare for welding or a welding job, select the best joint and prepare the joint for welding.

4.11 (Carrying the Puddle [Fuse]) Given oxyacetylene welding equipment and metal to weld without filler rod, establish a molten puddle and run straight even beads (without filler) in the flat or other positions assigned by the instructor.

4.12 (Run a Bead With Filler Rod) Given oxyacetylene welding equipment, steel plate, and filler rod; demonstrate the proper procedure for carrying the puddle with filler metal in the flat position or other positions that may be required by the instructor, to the instructor's standards.

4.13 (Weld Open Butt Joint, All Positions*) Given oxyacetylene welding station, filler rod, mild steel plates, personal safety equipment, and necessary tools and materials; groove weld a butt joint in all positions. The bead should be formed properly, straight, and uniform in ripple and width, with even height.

4.14 (Weld T-Joint, All Positions*) Given an oxyacetylene welding station, mild steel plates, and rod; construct a T-joint weld in all positions. Weld will be consistent in uniformity, penetration, and appearance and will bend 90 degrees without fracture or breaks.

4.15 (Fillet Weld, Lap Joint, Flat and Overhead* Positions) Given oxy-fuel work station, mild steel plate, rods; construct a lap weld in all positions. The weld will be straight, have consistency of width and height with proper build up and no slag, and will bend 180 degrees without cracks or breaks.

4.16 (Weld Corner Joint [Outside] Flat Position) Given an oxyacetylene welding station, mild steel plates, filler rods, personal safety equipment, and the necessary tools and materials; construct a corner joint in the Flat positions. The bead must be straight and uniform in height and width, have a uniform ripple formation, have no undercut, porosity, craters, or oxidation, and must be fused with the base metal. The crater must be completely filled at the end of the joint.

4.17 (Construct Pipe Weld in Fixed Position*) Given an oxyacetylene welding station, mild steel pipes, filler rods, personal safety equipment, and the necessary tools and materials; weld given pipe in fixed positions. Bead must be straight and uniform in height and width, have a uniform ripple formation, have no undercut, porosity, craters, or oxidation, and be smooth on inside of pipe. Root bead must completely penetrate into root of joint.

4.18 (Braze Mild Steel) Given an oxyacetylene welding station, mild steel coupon, brazing rod, flux, personal safety equipment, and the necessary tools and materials; braze mild steel. Bead must be straight and uniform in height and width, have a uniform ripple formation and have no undercut, porosity, craters, or oxidation.

UNIT 4.0 WELDING I - OXYACETYLENE

TASK 4.03 PERFORM SOAP AND WATER TEST (SAFETY)

PERFORMANCE OBJECTIVE:

Given oxyacetylene cutting/welding equipment to be tested for leaks, neutral soap and water, and proper instruction; perform a soap and water leak test. Mark (with tape, etc.) all discovered leaks for repair. Hoses and torch will not leak after repair and test.

PERFORMANCE ACTIONS:

4.0301 Close torch valves.

4.0302 Apply normal pressure.

4.0303 Mix neutral soap and water.

4.0304 Brush soapy water over hoses and valves.

4.0305 Check for bubbles.

4.0306 Mark discovered leaks with tape.

4.0307 Relieve hose pressure.

4.0308 Repair hoses and torch as required.

4.0309 Recheck for leaks.

PERFORMANCE STANDARDS:

- Perform soap and water leak test on oxyacetylene cutting/welding equipment to instructor's standards.

SUGGESTED INSTRUCTION TIME: Orientation Task

RELATED TECHNICAL INFORMATION:

- Oxy-fuel cutting/welding equipment.
- Proper safety precautions.

PART IV

SOME SOURCES OF READY-MADE TASK LISTS AND OBJECTIVES

There are a number of sources of ready-made task lists, objectives, standards, and criterion-referenced tests. The following list outlines a minimum of sources that were used by the Occupational Educational Articulation Program to initiate task lists.

GENERAL REFERENCE SOURCES

Dictionary of Occupational Titles
Occupational Outlook Handbook
Nonfarm Wage and Salary Employment by Occupation for Planning District I (Piedmont, SC), SC Employment Securities Commission Statistics Department, and other publications of the Commission
Outline of High School Credit Courses, SC State Department of Education
High School Credit Courses for The School District of Greenville County
Previous published curriculum guides, course syllabuses
Manufacturer's instruction books, handbooks, technical manuals, and training publications
How-to-do-it publications for the layman/hobbiest
Trade association and union publications, training manuals
Curriculum Advisory Committees
Instructors
Industrial/business training personnel

SOURCES OF CURRICULUM GUIDES AND MATERIALS

The following list of curriculum material sources represents some of those that supplies materials to the Occupational Education Articulation Program and are included to assist others in initiating a collection of reference materials. Many other excellent sources could be identified; however, this list will illustrate possible resources.

CODE TO SOURCES

Sources are grouped according to those providing a search or library service and catalog resources and are coded to inidicate the volume of materials typically available.

C	Catalog - Publications
Cs	Catalogs - Publications
L	Library
S	Search
S-C	Computer Search
1	Extensive Resources
2	Moderate Resources
3	Limited Resources
4	Membership Required
*	Recommended

VOCATIONAL CURRICULUM REPOSITORIES

Eastern Regional ACCTion Center
Tri-County Technical College
P.O. Box 587
Pendleton, SC 29670 L, 3, 4

ERIC Clearinghouse
Adult, Career, and Vocational Education (see below)

Southeast Curriculum Coordination Network
Mississippi State University
P.O. Drawer DX
Mississippi State, MS 39762 S, L, 1, *
(See enclosures at rear of this listing.)

The National Center for Research in
Vocational Education (ERIC)
The Ohio State University
1960 Kenny Road
Columbus, OH 43210 S-C, L, 1, *

STATE AND LOCAL SOURCES

Greenville County Library
Greenville, SC L, 3, *

Greenville Technical College
Library
Greenville, SC 29606 L, 2, *

Office of Vocational Education
SC State Department of Education
Chief Supervisor, Curriculum Development
Rutledge Building
Columbia, SC 29201 3, *

State Technical Coordinator, V-TEC
Dr. Robert T. Benson
(above address)
(See enclosure at rear of this listing.) 2, *

SC State Board of Technical and
Comprehensive Education
Division of Educational Services
111 Executive Center Drive
Columbia, SC 29210 3, *

SC Council on Vocational and Technical
Education
221 Devine Street, Suite 420
Columbia, SC 29205 L, 2, *

The School District of Greenville County
Professional Library
P.O. Box 2848 - 301 Camperdown Way
Greenville, SC 29602 L, 3, *

SOME REGIONAL, STATE, AND OTHER VOCATIONAL CURRICULUM MATERIAL PUBLISHERS

American Association for Vocational
Instructional Materials
Engineering Center - University of Georgia
Athens, GA 30602 C, 1

California State Department of Education
Bureau of Publications
721 Capitol Mall
Sacramento, CA 95814 C, 3

Center for Occupational Curriculum
Development
P.O. Box 7218
The University of Texas at Austin
Austin, TX 78712 C, 1

Center for Studies in Vocational Education
Florida State University
20003 Apalachee Parkway
3rd Floor
Tallahassee, FL 32301 C, 1

Kentucky Department of Education
Division of Materials and Curriculum
Competency-based Vocational Education
Materials from the State of Kentucky
Capital Plaza Tower
Frankfort, KY 40601 C, 1, *

Curriculum and Industrial Materials Center
Oklahoma State Department of Vocational
Education & Technical Education
1515 West 6th Avenue
Stillwater, OK 74074 C, 1

Curriculum Materials Service
Vocational Education Building
Colorado State University
Fort Collins, CO 80523 C, 1

East Center Network for Curriculum
Coordination
Illinois Vocational Curriculum Center
Sangamon State University
Springfield, IL 62708 C, 1

Portland State University
Division of Continuing Education
P.O. Box 1491
Portland, OR 97207 C

Michigan Career Education and Vocational
Education Resource Center
1333 Erickson Hall
Michigan State University
East Lansing, MI 48824 Cs, 2

Minnesota Curriculum Services Center
3554 White Bear Avenue
White Bear Lake, MN 55110 C, 3

New Jersey Vocational-Technical
Curriculum Laboratory
Rutgers - The State University
Building 4103 - Kilmer Campus
New Brunswick, NJ 08903 C, 1

The University of Georgia
College of Education
Division of Vocational Education
Vocational Education Materials Center
Green Street
Athens, GA 30602 C, 1

The Vocational Curriculum Catalog
Vocational Curriculum Management Center
Building 17, Airdustrial Park
Olympia, WA 98504 C, 1, *

United States Printing Office
Superintendent of Documents
Washington, DC 20402 Cs, 3

Vocational Curriculum and Research Center
State of Louisiana
P.O. Box 1159
Natchitoches, LA 71457 C, 1, *

Vocational Education Services
840 State Road 46 Bypass
Room 111
Indiana University
Bloomington, IN 47407 Cs

Vocational Studies Center
University of Wisconsin-Madison
964 Educational Sciences Building
1025 West Johnson Street
Madison, WI 53706 C, 3

PUBLISHERS

No attempt is made to represent all publishers of vocational education curriculum materials. The publishers listed represent some of those providing materials to the Occupational Education Articulation Program.

American Tech
12235 S. Larami Avenue
Alsip, IL 60658 C

Bennett Publishing Company
809 W. Detweiller Drive
Peoria, IL 61615 C

Bobbs-Merill Educational Publishing
4300 West 62nd Street
P.O. Box 7080
Indianapolis, IN 46206 C

Delmar Publishers Inc.
50 Wolf Road
Albany, NY 12205 C

Glencoe Publishing Co., Inc.
17337 Ventura Boulevard
Encino, CA 91316 C

Goodheart-Willcox
123 West Taft Drive
South Holland, IL 60473 C

Gregg/McGraw-Hill
1221 Avenue of the Americas
New York, NY 10020 Cs

Instructional Objectives Exchange
Box 24095-M
Los Angeles, CA 90024-0095 C, 3

John Wiley & Sons, Inc.
605 Third Avenue
New York, NY 10158 C, 3

McKnight Publishing Company
Box 2854
Bloomington, IL 61701 C

Prakken Publications, Inc.
Box 8623
Ann Arbor, MI 48107 C, 3

Reston Publishing Company
11480 Sunset Hills Road
Reston, VA 22090 C

South-Western Publishing Co.
5101 Madison Road
Cincinnati, OH 45227 C

Tab Books, Inc.
Blue Ridge Summit, PA 17214 C, 1, *

Teaching Aids Incorporated
Post Office Box 1798
Costa Mesa, CA 92626-0798 C, 1

Wm. C. Brown Company Publishers
2460 Kerper Boulevard
Duduque, IA 52001 C

nnccvte

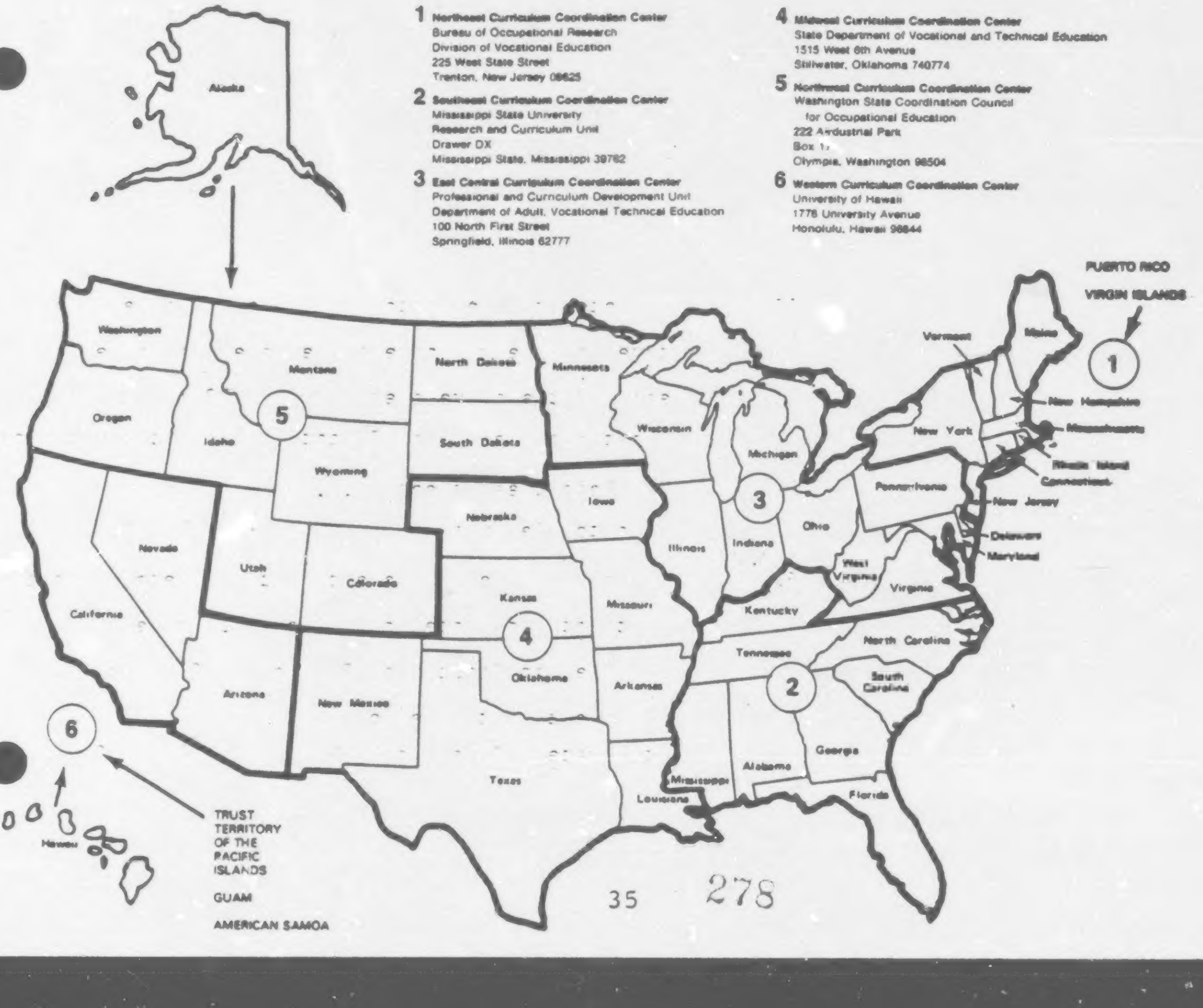
The National Network for Curriculum Coordination in Vocational & Technical Education is a USOE Sponsored Activity

MEMORANDUM

TO: Requestor

FROM: National Network for Curriculum Coordination in Vocational and Technical Education

Your request for a particular type of instructional material has been distributed to the State Liaison Representative in each state. The reverse side of this form indicates the materials and suggestions the responding State Liaison Representative has provided. You will be receiving many of these forms in response to your request which we hope will prove useful to you.


Alaska
Washington
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California
Nevada
Idaho
Montana
Wyoming
Utah
Colorado
Arizona
New Mexico
North Dakota
South Dakota
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Minnesota
Iowa
Missouri
Arkansas
Louisiana
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Illinois
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Kentucky
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Alabama
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South Carolina
North Carolina
Virginia
West Virginia
Maryland
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PUERTO RICO
VIRGIN ISLANDS
Hawaii
TRUST TERRITORY OF THE PACIFIC ISLANDS
GUAM
AMERICAN SAMOA
1
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1 **Northeast Curriculum Coordination Center**
Bureau of Occupational Research
Division of Vocational Education
225 West State Street
Trenton, New Jersey 08625

2 **Southeast Curriculum Coordination Center**
Mississippi State University
Research and Curriculum Unit
Drawer DX
Mississippi State, Mississippi 39762

3 **East Central Curriculum Coordination Center**
Professional and Curriculum Development Unit
Department of Adult, Vocational Technical Education
100 North First Street
Springfield, Illinois 62777

4 **Midwest Curriculum Coordination Center**
State Department of Vocational and Technical Education
1515 West 6th Avenue
Stillwater, Oklahoma 740774

5 **Northwest Curriculum Coordination Center**
Washington State Coordination Council
for Occupational Education
222 Airdustrial Park
Box 17
Olympia, Washington 98504

6 **Western Curriculum Coordination Center**
University of Hawaii
1776 University Avenue
Honolulu, Hawaii 96844

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curriculum search request

INSTRUCTIONS:

The National Network for Curriculum Coordination in Vocational and Technical Education (NNCCVTE) is sending you this form for the purpose of providing the requestor with immediate and appropriate information regarding extant curriculum products which relate to his/her area of concern. In response to this request **PLEASE IDENTIFY BRIEFLY ON THIS SHEET AS MANY INSTRUCTIONAL PRODUCTS AS YOU OR YOUR AGENCY HAVE AVAILABLE OR KNOW OF WHICH MEET THE NEED OF THE REQUESTOR AS OUTLINED** and indicate if you are sending any or all of these materials as complimentary copies, loan copies (be sure to state the period of loan), or for purchase. Note also any source which you might recommend be contacted.

REQUEST:

1.) Mail the copy of this form marked "Requestor" and any materials directly to:

2.) Return the other copies of this form to:
Southeast Network for Curriculum Coordination
Mississippi State University
Research and Curriculum Unit
Drawer DX
Mississippi State, MS 39762

NOTE: PLEASE RETURN FORM EVEN IF YOU HAVE NO MATERIALS OR RECOMMENDATIONS TO MAKE.

I am sending this as a complimentary copy	I am sending on loan basis only	I recommend this source be contacted	TITLE/SOURCE	MEDIA	COST	ERIC NUMBER IF AVAILABLE
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☐	☐	☐				
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☐ SORRY, I HAVE NO INFORMATION ON THIS TOPIC.

This information is being sent from (Your Name) ______________________ of the (circle appropriate Center) Northeast CMC Southeast CMC Midwest CMC East Central CMC Western CMC Northwest CMC

V-TECS

New Resources for Nonmembers

THE 100-PLUS Catalogs of Performance Objectives and Performance Guides developed for specific occupations by V-TECS are now available for purchase by nonmembers of the Consortium.

Any person or agency not located in a V-TECS member state may buy these materials on a single-copy basis for use as a resource in local curriculum development and delivery of instruction.

The catalogs provide duty areas, tasks, performance objectives, performance guides, standards, lists of tools and equipment, and bibliographies for the occupations covered. Discounts are offered for quantity purchases.

Use of the purchased materials is restricted by V-TECS copyright. They cannot be reproduced for further distribution or commercial use without permission. However, a nonmember organization interested in mass producing or disseminating the catalogs may purchase a license to reproduce from V-TECS.

If you are located in a member state (Alabama, Florida, Georgia, Illinois, Kentucky, Maryland, Michigan, Pennsylvania, South Carolina, Virginia, West Virginia), you can contact the V-TECS coordinator at your state agency for vocational education for more information on acquiring a catalog.

Listed below are the catalogs currently available. An additional 24 are under development. Sale of these products is intended by V-TECS members to extend some of their benefits to nonmembers, by providing access to valuable resources at reduced developmental cost for implementation of competency-based vocational education.

Catalog Order Form

Check the desired titles.

To order, send your filled-in form and payment to V-TECS, Commission on Occupational Education Institutions, Southern Association of Colleges and Schools, 795 Peachtree St. N.E., Atlanta, GA 30365. For more information, direct your inquiry to Ron McCage, Director, at the same address. The phone number is (404) 897-6158.

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- ☐ Cotton Grower
- ☐ Custom Dressmaker
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- ☐ Dental Assistant
- ☐ Dental Hygienist
- ☐ Dental Laboratory Technician
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- ☐ Diesel Mechanic
- ☐ Duplicating Machine Operator
- ☐ Electronic Mechanic
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- ☐ Meat Cutter
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- ☐ Medical Laboratory Technician
- ☐ Medical Records Technician
- ☐ Medical Secretary
- ☐ Miner I - Underground Coal Mine Worker
- ☐ Nuclear Medicine Technologist
- ☐ Nursery Worker
- ☐ Nurse's Aide/Orderly
- ☐ Oil Field Technician
- ☐ Operating Room Technician Competencies
- ☐ Orchardist
- ☐ Parenting
- ☐ Patrol Officer
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- ☐ Printing Occupations
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- ☐ Radiographer
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- ☐ Secretary
- ☐ Security Guard
- ☐ Sheet Metalworker
- ☐ Ship Operations
- ☐ Small Engine Repairer
- ☐ Solar Heating Mechanic
- ☐ Swine Farmer
- ☐ Tax Collector
- ☐ Tobacco Grower
- ☐ Tractor Mechanic
- ☐ Tractor Trailer/Truck Driver
- ☐ Underground Coal Mine Machine Maintenance
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Source: Open Entries, Tallahassee, FL: The Center for Studies in Vocational Education, Florida State University, December, 1982.

Occupational Education Articulation Program
of The School District of Greenville County
and Greenville Technical College

Thank you for your inquiry and interest concerning the Occupational Education Articulation Program.

Material produced by the Occupational Education Articulation Program currently includes:

1981-1982

Workshop Guide I: Writing Performance-based Objectives, Task Actions, and Performance Standards (140 pages)

Workshop Guide II: Writing Outcome-referenced (criterion-referenced) Tests (71 pages)

Policies and Procedures Guide for Articulation of Occupational Education Programs Between The School District of Greenville County and Greenville Technical College (110 pages)

Articulated, Performance-based Instruction Guide for Drafting I (265 pages)

Articulated, Performance-based Instruction Guide for Business and Office Education (625 pages) with Modules for:

- Typewriting I and II (160 pages)
- Shorthand I and II (100 pages)
- Accounting I and II (95 pages)
- Office Procedures (110 pages)
- Business English (125 pages)

Final Report, Volume I, 1981-1982, Occupational Education Articulation Program (15 pages)

1982-1983

Articulated, Performance-based Instruction Guide for Automotive Mechanics (450+ pages)

Articulated, Performance-based Instruction Guide for Building Construction/Carpentry (300+ pages)

Articulated, Performance-based Instruction Guide for Food Service/Commercial Cooking/Food Service Manangement (420+ Pages)

Articulated, Performance-based Instruction Guide for Welding (210+ pages)

Articulated, Performance-based Instruction Guide for Drafting II (100+ pages)

Final Report, Volume II, 1982-1983, Occupational Education Articulation Program (10 pages)

To aid others in the development of articulation or performance-based (competency-based) materials, copies of documents and guides produced by this Program are available from the following sources.

1. National sources:

ERIC Clearinghouse
Adult, Career, and Vocational Education
Ohio State University
1960 Kenny Road
Columbus, OH 43210

Southeast Curriculum Coordination Network
Research and Curriculum Unit
Mississippi State University
P.O. Drawer DX
Mississippi State, MS 39762

2. State sources:

S.C. Council on Vocational and Technical Education
Attention: Dr. Robert H. White
221 Devine Street, Suite 420
Columbia, SC 29205

Office of Vocational Education
South Carolina State Department of Education
Attention: Dr. Robert T. Benson
Chief Supervisor, Curriculum Development
Rutledge Building
Columbia, SC 29201

S.C. State Board of Technical and Comprehensive Education
Division of Educational Services
Attention: Dr. Cecil Walters
111 Executive Center Drive
Columbia, SC 29210

3. Local sources:

The School District of Greenville County
Professional Library
P.O. Box 2848 - 301 Camperdown Way
Greenville, SC 29602

4. In addition, copies of documents have been provided to Business and Office Education and Trade and Industrial Supervisors in the Office of Vocational Education, S.C. State Department of Education. Complete sets of documents have been provided to each Vocational Education Center Director, The School District of Greenville County. Complete sets of documents are available in the office of Mr. Richard Cothran, Consultant for Vocational Education, The School District of Greenville County; and Dr. Kay Grastie, Associated Vice President for Instruction, Greenville Technical College.

The Policies and Procedures Guide and the two Workshop Guides contain state-of-the-art references concerning articulation, the development of performance-based (competency-based) curriculum material, and outcome-referenced (criterion-referenced) tests. These documents are designed so that principals or others might use them in coordinating the development of articulation or competency-based vocational education materials.

Each instruction guide contains the references used to develop the course objectives, actions, standards, and tests as well as sources concerning articulation or competency-based vocational education.

We hope this information and referral will answer your inquiry. Please contact us if you have specific questions that are not answered or if we might be of further assistance.

Sincerely yours,

Wm. Edward Henderson Jr.

Wm. Edward Henderson Jr., Coordinator
Occupational Education Articulation Program

WEH/tae

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WORKSHOP GUIDE II

PREPARING OBJECTIVES, PERFORMANCE ACTIONS, AND STANDARDS FOR ARTICULATED, PERFORMANCE-BASED INSTRUCTION

by

Wm. Edward Henderson Jr.

May, 1983

DISCRIMINATION PROHIBITED

Title VI of the Civil Rights Acts of 1964 states: "No person in the United States, shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefit of or be subjected to discrimination under any program or activity receiving federal financial assistance." The Occupational Education Articulation Program is operated in compliance with this law.

The opinions expressed herein do not necessarily reflect the position or policy of the funding or sponsoring organizations and no official endorsement by those organizations should be inferred.

BIAS STATEMENT

Articulated, performance-based instruction guides are developed based upon tasks (objectives) important to the success of entry level workers. The objectives are derived from task analysis and available tasks lists such as V-TEC Catalogs. Standards of performance are those expected by local businesses and industries for job success. Test samples are included to represent valid and reliable measures of vocational competency.

Articulated, performance-based instruction documents are designed to comply with the requirements of PL 94-482 Educational Amendments of 1976, Title II, which is intended to "...ensure that...curricula do not reflect sterotypes based upon sex, race, or national origin..."

COPYRIGHTED DISCLOSURE STATEMENT

Every effort has been made to appropriately document any copyrighted material used in this articulated, performance-based instruction document.

Many ideas and models, however, have evolved from years of research and experience and often are difficult to precisely credit.

The objectives and task actions of the articulated guides are developed or contributed by task force committee (instructor) participants based on their expertise and on task lists from resources such as V-TEC Catalogs. Standards included in guides are those identified by local potential employers as important to the success of entry level workers. Sample knowledge and performance tests are included to represent valid and reliable test items that may be used to measure mastery of objectives. Test samples taken from texts or workbooks typically are those being used locally and appropriate documentation has been included.

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Wm. Edward Henderson Jr., Coordinator
Occupational Education Articulation Program
The School District of Greenville County
and Greenville Technical College
1983

Henderson, Wm. Edward, Jr., *Workshop Guide II: Preparing Objectives, Performance Actions, and Standards for Articulated, Performance-based Instruction*, Greenville, SC: Occupational Education Articulation Program of The School District of Greenville County and Greenville Technical College, May, 1983.

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PREFACE

The emergence of "high technology" and the need for skilled workers when unemployment is high reflects some of the factors encouraging vocational education to adjust its emphasis in existing instructional efforts and expand its role in "state-of-the-art" instructional systems to meet the needs of both students and industry.

No longer can vocational instruction be developed according to program titles. Alternate instructional methods must be time-based, flexible to meet the needs of a constantly changing work-force, designed to serve the needs of students and industry, and must be of the highest quality.

Research clearly indicates that instructional technology and accountability demands will increase the movement towards the use of instructional systems.

The systems approach is a method of organizing the instructional situation, methods, media, materials, and equipment so that the maximum knowledge and skill development may be achieved.

The systems approach directs its attention toward teaching the observable behaviors the student should possess at the termination of instruction.

This workshop guide is designed to serve:

1. A workshop leader or coordinator who may wish to articulate similar programs of vocational education or develop performance-based instruction.
2. Workshop participants or the teachers who will be developing performance-based curriculum materials.

Several related workshop guides have been developed to assist in the development of performance-based instruction.

1. Workshop Guide I is an introduction to and sample of how "task analysis" provides essential information upon which to build the performance-based instructional description.
2. Workshop Guide II is an elementary how-to-do-it instruction in writing/developing performance-based objectives, performance actions, and standards.
3. Workshop Guide II is concerned with the task of writing valid outcome-referenced measures and offers suggestions on validating test items.

Other support material concerns: building validity objectives, standards, and tests; developing lesson plans; developing learning activities to accomplish objectives; and arranging the sequence of instruction.

Workshop Guides II and III include a suggested timetable for the workshop as well as an agenda. Each guide is written so that it may be reproduced as a "handout" for participants.

The workshop guides complement each other and are designed to aid the development of performance-based instruction descriptions for articulation purposes. It is recommended that the workshop leader review all three guides and suggested resources prior to initiating the first workshop because of the interrelationship of task analysis, writing valid objectives, and writing valid test items.

The workshop guides are not intended to represent the latest, last, or best work in performance-based instruction. They, however, do represent current concepts and activities in performance-based instruction. The organization of the guides follows an instructional systems approach rather than a traditional educational approach to curriculum development.

The goal of the guides is to provide a common framework of terminology and concepts by which performance-based instruction/curriculum guides may be developed.

Greenville, SC W. E. H.

WORKSHOP II

PREPARING OBJECTIVES, PERFORMANCE ACTIONS, AND STANDARDS
FOR
ARTICULATED, PERFORMANCE-BASED INSTRUCTION

PART I

SYSTEMS APPROACH TO ARTICULATED, PERFORMANCE-BASED INSTRUCTION

ARTICULATING BY PERFORMANCE-BASED INSTRUCTION

Performance-based instruction has been selected as the vehicle for articulation because it is an effective way of communicating intended achievements to others. The objectives for a secondary vocational program easily may be compared with the expected entry performance for a similar vocational program at the post-secondary level or for employment. The two should intermesh. Where they do not intermesh, training adjustments should be made.

PERFORMANCE-BASED INSTRUCTION

Performance-based (competency-based) instruction is based on the competencies or tasks performed by on-the-job workers. In comparison, traditional instruction generally is based on course titles and hours, and reporting of results by letter grade does not indicate, other than in a general fashion, what specific tasks or competencies the student can perform successfully.

Everything in a performance-based instructional system is made public beforehand. There are no surprises for the student, teacher, counselor, or employer. When the student begins a CBVE program, information is available to tell the student exactly what competencies are expected to be developed as a result of the instructional program, how and against what standards or criteria the student will be evaluated, and how the student's competencies will be communicated to the student, to instructors, and to employers. A performance-based instructional system tells the student exactly what the student must learn, teaches the student that skill or knowledge, and then tests on mastery of that specific competency.

Performance-based reporting tells a receiving instructor or potential employer exactly what a student has demonstrated he/she can and cannot do. The performance-based reporting system indicates that the student has successfully completed a specified competency to at least the minimum standard. If a competency is not reported, then the student has not been taught that competency or is unable to perform the specified behavior at a specified level of competency.

Performance-based instruction has been chosen as the vehicle for articulation because it is centered heavily around performance outcomes which can be described and measured.

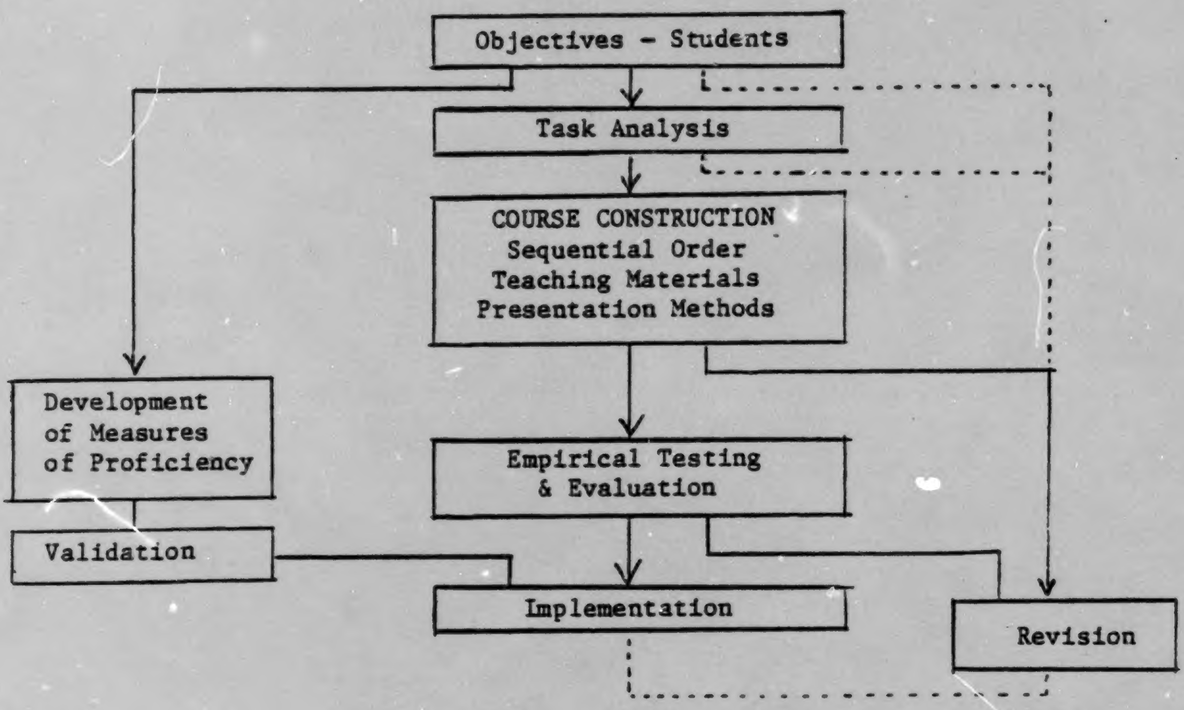
A SYSTEMS APPROACH TO PERFORMANCE-BASED INSTRUCTION

The systems approach emphasizes the specification of instructional objectives, precisely controlled learning experiences to achieve the objectives, criteria for performance, and evaluation information. There is nothing new in the systems-approach.

Several important characteristics distinguish the systems-approach to instructional technology:

- System feedback encourages continuous updating and improvement of the instructional process. CBVE instruction programs are never finished products: They must be continually adapted to meet stated objectives.
- There is a complex interaction among components of the system and emphasis is on the total system rather than with the objectives of any single component.
- It provides a frame of reference for planning and remaining on target.
- It should be one of a whole set of interacting systems, influenced by institutional policy or such things as selection and assignment of students to programs.

Systems Approach


Objectives - Students
Task Analysis
COURSE CONSTRUCTION
Sequential Order
Teaching Materials
Presentation Methods
Development of Measures of Proficiency
Validation
Empirical Testing & Evaluation
Implementation
Revision

Schematic of a systems approach to instruction. The actual system may vary with the program, institution, or individual instructor.

ADVANTAGE OF A SYSTEMS APPROACH

One advantage of using a systems approach to vocational education is that there is a starting point, a middle phase through which the student and instructor move, and an end point or objective of the training.

In the systems approach, major units or stages of the learning process are identified. Training tasks are broken down into steps or movements from the present stage to the desired level of performance. Key, or "punctuation," points that reinforce accomplishment of tasks are identified. By reviewing the performance-based instructional description which is written in terms of what the student should be able to do upon completing training, the student should become familiar with and accommodate to the vocational program.

PART II

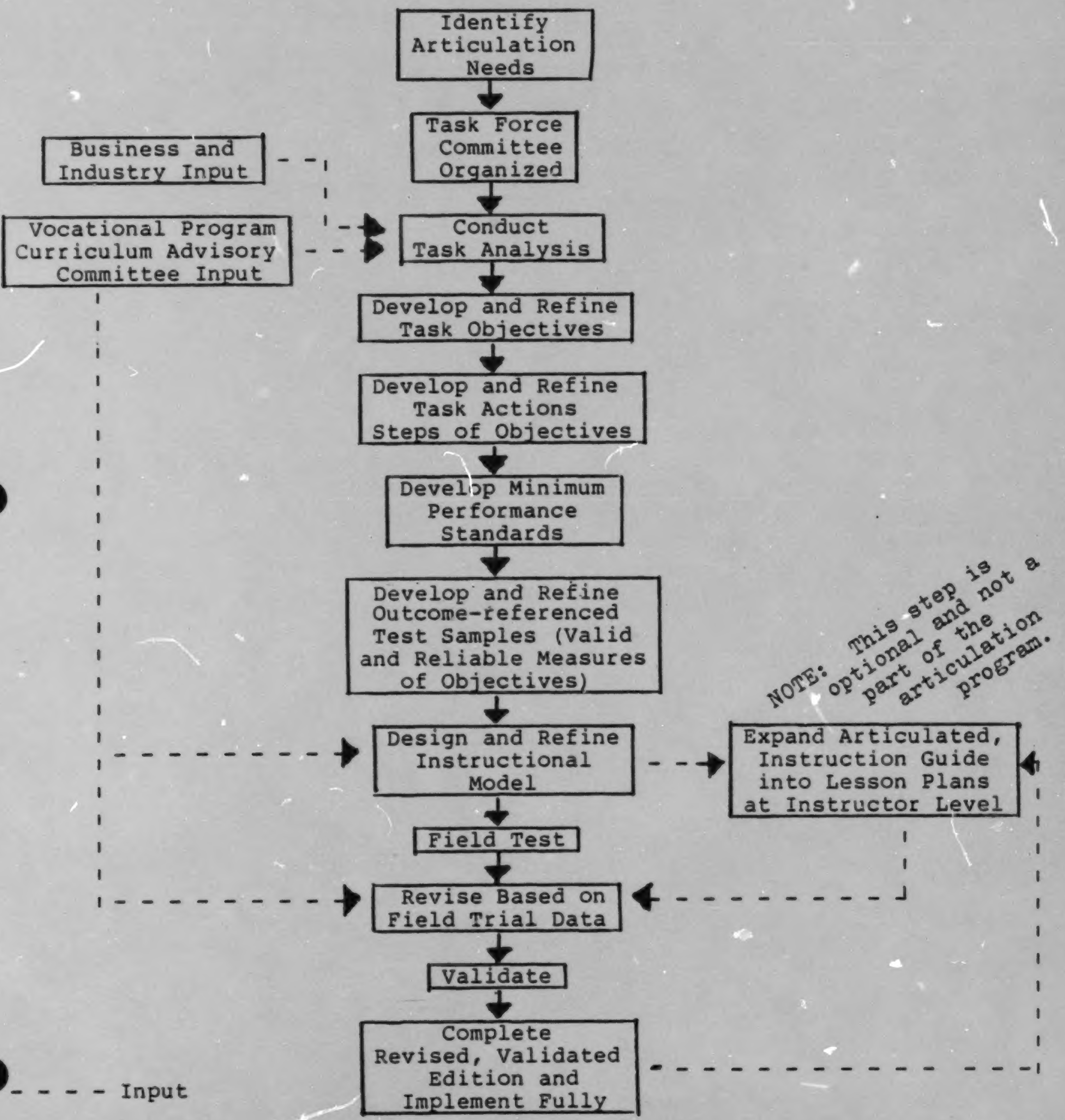
DEVELOPMENT PROCESS OF ARTICULATED, PERFORMANCE-BASED INSTRUCTION GUIDES

Traditionally, educators have tended to generate instructional objective from content, working forward to an output. More recently, there has been emphasis on constructing instructional objectives for a specified job, working from performance to curriculum development. This competency-based approach is promoted in the articulation program to ensure the validity of curriculum objectives and content.

The articulated, performance-based instruction guides emphasize the systems approach to vocational education which starts with a definition of the purpose of the training. This definition (objectives statement) remains the criteria for evaluation throughout the course, and achievement against the stated goals is the measure of success.

The accompanying flowcharts illustrate: (a) a schematic of the articulated, performance-based instruction guide development process and (b) the simplified steps in the development process.

SCHEMATIC OF
ARTICULATED, PERFORMANCE-BASED INSTRUCTION GUIDE DEVELOPMENT PROCESS


Identify Articulation Needs
Task Force Committee Organized
Business and Industry Input
Vocational Program Curriculum Advisory Committee Input
Conduct Task Analysis
Develop and Refine Task Objectives
Develop and Refine Task Actions Steps of Objectives
Develop Minimum Performance Standards
Develop and Refine Outcome-referenced Test Samples (Valid and Reliable Measures of Objectives)
NOTE: This step is optional and not a part of the articulation program.
Design and Refine Instructional Model
Expand Articulated, Instruction Guide into Lesson Plans at Instructor Level
Field Test
Revise Based on Field Trial Data
Validate
Complete Revised, Validated Edition and Implement Fully
- - - - Input

Schematic design by Ed Henderson Jr., 1982.

SIMPLIFIED STEPS OF THE DEVELOPMENT OF ARTICULATED, PERFORMANCE-BASED INSTRUCTION GUIDES

DOCUMENT PRE-DEVELOPMENT ACTIVITIES

(WS) WORKSHOP TO ENSURE ALL TASK FORCE COMMITTEE PARTICIPANTS ENTER THE DEVELOPMENT PROCESS WITH A COMMON UNDERSTANDING OF THE PROGRAM, TASKS EXPECTED OF THEM, AND A COMMON LANGUAGE

↓

SURVEY SIMILARITIES OF SECONDARY AND POST-SECONDARY PROGRAMS

↓

DESCRIBE SECONDARY AND POST-SECONDARY SIMILAR PROGRAMS OF TRAINING: CURRICULUM AREAS TO BE DEVELOPED INTO COMPETENCY-BASED DESCRIPTION

↓

IDENTIFY STATE AND LOCAL EDUCATIONAL STANDARDS

↓

(WS) WORKSHOP PRECEEDS TASK ANALYSIS TO IDENTIFY PERFORMANCE EXPECTATIONS OF POTENTIAL EMPLOYERS

↓

INPUT FROM CURRICULUM ADVISORY COMMITTEES THROUGH INSTRUCTOR/INSTITUTIONAL PARTICIPANTS (SURVEYS AS NECESSARY)

↓

DOCUMENT DEVELOPMENT PROCESS

(WS) WORKSHOP ON WRITING OBJECTIVES, ACTIONS, AND STANDARDS

↓

DEVELOP VALID TASK LIST OF PERFORMANCE OBJECTIVES

↓

ARRANGE PERFORMANCE OBJECTIVES IN LEARNING SEQUENCE

↓

SEQUENCIAL LISTING OF PERFORMANCE ACTIONS TO REACH OBJECTIVES

↓

IDENTIFY PERFORMANCE STANDARDS FOR TASK COMPETENCY

↓

IDENTIFY "SUGGESTED INSTRUCTIONAL TIMES" FOR PLANNING PURPOSES

↓

IDENTIFY RELATED TECHNICAL INFORMATION FOR EACH OBJECTIVE

↓

REVIEW OF OBJECTIVES, ACTIONS, AND STANDARDS BY CURRICULUM ADVISORY COMMITTEES THROUGH TASK FORCE COMMITTEE PARTICIPANTS

↓

(WS) WORKSHOP PRECEEDS DEVELOPMENT OF OUTCOME-REFERENCED TEST SAMPLES

↓

REVIEW TEST ITEMS AGAINST OBJECTIVES TO ENSURE THERE IS AGREEMENT IN CONDITION, PERFORMANCE, AND STANDARDS

↓

SUMMARIZED INSTRUCTIONAL TIME ESTIMATES AND ADJUST TO EQUAL PROGRAM REQUIREMENTS

↓

LIST MINIMUM TRAINING EQUIPMENT

↓

DEVELOP STATE-OF-THE-ART BIBLIOGRAPHY

↓

IDENTIFY AND DEVELOP APPENDIXES

↓

POST-DEVELOPMENT PROCESS

MUTUAL AGREEMENT (SIGNED BY INSTRUCTOR PARTICIPANTS) CONCERNING ARTICULATION DOCUMENTS

↓

(WS) ORIENTATION WORKSHOP TO EXIT DEVELOPMENT PROCESS: SUMMARIZE ARTICULATION PROGRAM AND COMPETENCY-BASED INSTRUCTION TO ALL TEACHER PARTICIPANTS

↓

FIELD TRIAL IMPLEMENTATION, VALIDATION STUDY

↓

CORRECTIONS, REVISIONS, AND MODIFICATIONS BASED ON FIELD TRIAL FINDINGS

↓

FULL IMPLEMENTATION OF GUIDES

↓

PERIODIC REVIEW, TASK SURVEY WITH INDUSTRY, ETC., TO ENSURE VALIDITY OF ARTICULATED, PERFORMANCE-BASED INSTRUCTION GUIDES

(WS) = Workshop

Process design
by Wm. Edward Henderson Jr.
Revised May, 1983

PART III

COGNITIVE - PSYCHOMOTOR - AFFECTIVE LEARNING CONSIDERATIONS IN DEVELOPING PERFORMANCE-BASED INSTRUCTION

Cognitive, psychomotor, and affective domains of learning are very important considerations in the successful design of performance-based instruction. While knowledge, skill, and attitude behaviors may interact and influence the final occupational performance, separate considerations are required to write valid training objectives and plan effective learning activities.

The following summary chart illustrates important considerations concerning knowledge, skill, and attitude behaviors.

KNOWLEDGES	SKILLS	ATTITUDES
Not directly observable.	Involves physical or manipulative action.	Not directly observable.
Involves mental processes and use of symbols.	Involves special requirements for speed, accuracy, or coordination.	Behavior must be inferred from overt verbal and non-verbal behavior.
Student must be able to use symbol associated with knowing something.	*Performance actions that have no special requirements for coordination should be considered unskilled activities.	Predispositions or tendencies to make specific responses to certain situations, objects, etc.

Source: Howard, D. R., Handbook for Designers of Instructional Systems, Task Analysis, Volume II, Washington, DC: US Government Printing Office (Department of the Air Force), 1973, p 3.2.

The enclosed charts are included to illustrate the levels of learning/performance difficulty in the different domains and considerations that may be applied in writing performance objectives.

A COMPARISON OF CATEGORIES OF DOMAINS

LEVEL OF DIFFICULTY	COGNITIVE (e.g., Knowledges)	PSYCHOLOTOR (e.g., Skills)	AFFECTIVE (e.g., Attitudes)
(More)	EVALUATION-involves acts, decision-making judging, or selecting based on criteria and rationale (requires synthesis in order to evaluate.)	NATURALIZATION-completes one or more skills easy and becomes automatic with limited physical or mental exertion.	CHARACTERIZING-total behavior is consistent with values internalized.
	SYNTHESIS-combines elements to form new entity from original one (requires analysis in order to synthesize).	ARTICULATION-combines more than one skill in sequence with harmony and consistency.	ORGANIZING-committed to set of values as displayed by behavior.
	ANALYSIS-separates whole into its parts, until relationship among elements is clear (requires ability to apply information in order to analyze).	PRECISION-reproduction of a skill with accuracy, proportion, and exactness; usually performed independent of original source.	VALUING-displays behavior consistent with single belief or attitude in situations where forced to comply or obey.
	APPLICATION-uses information in a situation different from original learning context (requires comprehensive of information in order to apply it in a new situation).	MANIPULATION-performance of skill according to instruction rather than observation.	RESPONDING-complies to given expectations by attending or reacting to stimuli or phenomena (such as interests).
	COMPREHENSION-interprets, translates, summarizes or paraphrases given information (requires knowledge in order to demonstrate comprehension).	IMITATION-observes skill and attempts to repeat it.	RECEIVING-aware of passively attending to certain phenomena and stimuli (such as listening).
(Less)	KNOWLEDGE-recognition, and recall of facts and specifics.		

Bloom, Benjamine S. (Ed.) Taxonomy of Educational Objectives, Handbook I: Cognitive Domain, NY: David McKay Co., Inc., 1965.

Armstrong, Robert J. (et al), by R. H. Dave, Developing and Writing Behavioral Objectives, Tucson, AZ: Educational Inovators Press, 1970.

Krathwohl, David R., Bloom, Benjamine S., and Masia, Berthram B. Taxonomy of Educational Objectives, Handbook II: Affective Domain, NY: David McKay Co., Inc., 1964.

DESCRIPTION AND SAMPLE WORDING OF PERFORMANCE-CONDITION-CRITERIA STATEMENTS IN THE COGNITIVE-PSYCHOMOTOR-AFFECTIVE DOMAINS

	PERFORMANCE	CONDITION	CRITERIA	
COGNATIVE DOMAIN	Performances requires knowledge of specific information (principles, concepts, generalizations). - "define the terms" - "identify the probable carburator problem" - "arrange steps in the proper sequence"	Conditions typically include given information. - "given a list of welding terms" - "given a schematic of an alternator charging system"	Criteria typically calls for accuracy to certain standards or reference criteria. - "with 80 percent accuracy" - "according to manufacturer's specifications" - "to entry level standards of the industry"	COGNATIVE DOMAIN
PSYCHOMOTOR DOMAIN	Basically skill performances involve the manipulation of objects, tools, supplies, or equipment. - "type a business letter" - "frame a wall" - "change sparkplugs"	Conditions describe the necessary materials or environment ...(tools, equipment, supplies, etc.). - "in a simulated office situation" - "given necessary blueprints and construction materials" - "given mechanics tool box, set of plugs for engine, and gauge..."	The criterion typically concerns the actual performance or the finished product or the level of mastery...(accuracy within tolerance limit, speed, degree of excellence...). - "at 45 words per minute with no more than two errors per page" - "to meet all building codes and instructor's checklist for wall framing" - "compared to demonstration product baked by [illegible]"	PSYCHOMOTOR DOMAIN
AFFECTIVE DOMAIN	Performances involve the demonstration of feelings attitudes or sensititivies toward other persons, ideas, or things. - "demonstrate concern for safety within the laboratory" - "takes more responsibility for own training development"	Conditions are situations in which students can demonstrate affective performance... - "in the actual work situation" - "at all times within the lab" - "upon completion of the unit on fire safety"	(Feelings are not directly measurable!) The behavior must demonstrate that a feeling or attitude is present. - "reports a hazardous condition in the shop" - "participates in shop/class discussion voluntarily" - "takes on a project without being asked"	AFFECTIVE DOMAIN

SAMPLE OF OCCUPATIONALLY TRANSFERABLE SKILLS WITH SELECTED EXAMPLES

COGNITIVE

Communications

- Read and evaluate
- Write technical reports
- Speak fluently
- Listen attentively

Mathematics

- Read graphs
- Determine equivalents
- Compute ratios
- Solve work problems

Reasoning

- Develop classifications
- Make decisions
- Outline plans
- Set priorities

PSYCHOMOTOR

Such as:

- Measure distance
- Draw graphs
- Operate calculator
- Type (write)
- Adjusts idle set

AFFECTIVE

Attitudes toward work

- Responsibility
- Diligence
- Determination/perseverance
- Reliability

Attitudes toward others

- Converses pleasantly
- Reacts to others
- Manages others
- Gives praise

Attitudes toward self

- Self-confidence
- Self-discipline
- Self-actualization
- Assertiveness

Source: Minimum Competencies and Transferable Skills: What Can Be Learned from the Two Movements, Columbus, OH: The National Center for Research in Vocational Education, p. 22, 1978.

PART IV

TYPES OF PERFORMANCE

Five types of performance that may be associated with task actions are suggested by Mager and Beach (Developing Vocational Instruction). One or more performances may be associated with a task. The performance primarily associated with the action or task step must be identified to aid the decision on course content, procedures, and materials. The five types of performance are:

1. Discrimination: Knowing when to do it, knowing when it is done.
2. Problem-solving: How to decide what to do.
3. Recall: Knowing what to do, knowing why to do it.
4. Manipulation: How to do it.
5. Speech: How to say it.

The main performance type associated with the task step or action is important because it will influence the content selection and instructional methods used to help the student obtain the training objective.

DISCRIMINATION

Discrimination is the ability to tell the difference between two or more things. Are they alike or different?

Discrimination is the ability to tell if a thing is "the same or different from a mental image of what it ought to be." It is recalling from memory to decide what should be.

When the task specification "calls for the student to be able to distinguish one thing from another, to tell when a proper job has been done, to tell when a task needs to be done, or to see the difference between correct and incorrect, the principal type of performance called for is discrimination."

PROBLEM-SOLVING

After discriminating (perceiving) that a job needs to be done, the next step would be finding the problem or trouble. Problem-solving teaches the student "procedures that will lead the student to locate the trouble."

When the student is asked "to figure out the best way of doing something or to decide what to do next," the student is being asked to problem-solve.

Problem-solving is best taught by showing symptoms and allowing the student to experience finding the trouble and by the student solving as many problems as possible.

RECALL

When the "principal" feature of a task action is that it requires knowing what to do more than how to do it, the principal type of performance is recall.

Those "things the student just has to know" involves performance-based on recall. If the instructor expects the student to know the items or parts of a tool kit, when the kit is mentioned or a repair actions the kit is associated with is mentioned, the performance called for is recall.

Recall is the principal performance associated with a great deal of visible activity. The student must recall to recite or perform in speaking.

Because the process of recall (remembering) is a mental or internal performance, generally it is measured through a knowledge or pencil-paper test.

Recall may involve sequencing or chaining of actions where each step must be performed in a precise sequence.

MANIPULATION

"Knowing what to do is not always the same as knowing how to do it."

"Manipulation is taught by providing an opportunity to manipulate under conditions as close as possible to those found on the job."

"If the listing of task actions only includes manipulation, something is wrong. Either task steps are not accurately listed, or the decisions about principal performance types need to be reviewed."

SPEECH

When the "style of verbal behavior called for in a task step is important to job sucess," such as the telephone manner and skill of a receptionist, speaking is the principal type of performance.

Adopted from Developing Vocational Instruction, Robert F. Mager and Kenneth M. Beach, Jr., pp. 44-51, 1967.

SAMPLE IDENTIFICATION OF PERFORMANCE TYPES

The following illustration will show how task actions may be identified with "types of learning performance."

TASK: HAND SOLDERING

PERFORMANCE OBJECTIVE:

Upon completion of this task unit, correctly and safety use a soldering iron or gun to make required solder connections.

PERFORMANCE ACTIONS (Sequencing):	(Learning Type)
1. Identify solder types	Concept
2. Solder uses	Rule-learning
3. Describe safety equipment and procedures	Rule-learning
4. Describe how to solder with irons	Rule-learning
5. Describe how to solder with guns	Rule-learning
6. Identify equipment for cleaning irons, guns, solder connection	Rule-learning
7. Clean soldering iron	Manipulation
8. Clean soldering gun	Manipulation
9. Tin soldering iron	Manipulation
10. Tin soldering gun	Manipulation
11. Identify procedures for soldering wire splices	Rule-learning
12. Solder wire splices	Manipulation
13. Describe how to solder wires to terminals	Rule-learning
14. Solder wires to terminals	Manipulation

PART V

WRITING VALID INSTRUCTIONAL OBJECTIVES

WHAT SHOULD BE TAUGHT?

The articulated, performance-based instruction guides are designed to answer three critical questions necessary for quality vocational instruction:

1. What should be taught?
2. How should it be taught?
3. How should students be evaluated?

In answer to the first question, "What should be taught?", the objectives of the articulated, performance-based vocational education program are based on extensive task analysis and validation. The task objectives represent what employers in business and industry say is important for entry level job success.

GOALS AND OBJECTIVES

Goals provide an overview of the ultimate purpose of the vocational program. Typically, goals are:

- abstract
- broad in scope
- long-term

Objectives, in comparison, are:

- specific
- concrete
- measurable
- short-term

TRADITIONAL AND PERFORMANCE-BASED OBJECTIVES

It is easy to find teachers who claim to have been using "objectives" for years. Sometimes, some of these teachers are quick to point out that their use of objectives just does not work in their situation. Probably, many of these teachers are using objectives designed for a traditional education approach. Performance/competency-based objectives can be distinguished easily from traditional objectives.

Traditional goals and "lesson plan objectives" typically describe materials, procedures, topics, and content and may be rather abstract.

In contrast, performance/competency-based vocational education objectives may be described as follows:

- Performance-based objectives emphasize observed activity, best illustrated by the type of acceptable and non-acceptable verbs that are used in writing behavioral objectives.

- The objective emphasizes student activity to accomplish a job-like performance.

- The objective emphasizes outcomes in terms of what the student will know or be able to do in job-like behavior.

- Performance-based education objectives tell the student how achievement will and will not be recognized.

In the articulation program, performance-based education objectives are a convenient way to communicate intended achievement to others.

OBJECTIVES AND OUTCOMES

Objectives might be defined as the desired instructional outcomes which are systematically worked toward. There, however, are many instructional outcomes, some of which correspond to objectives.

THREE KINDS OF OBJECTIVES

1. Behavioral objectives - Behavioral objectives are outcome statements that are concerned with student performance in one of the three behavioral domains (cognitive, psychomotor, or affective). Most performance-based instructional objectives will be behavioral objectives.

   Behavioral objectives typically include the following information:

   - What behavior is expected?
   - Who will perform the specified behavior?
   - How will the behavior be measured?
   - What is the expected proficiency level?
   - What amount of time is required to accomplish the objective or demonstrate competency?

   Behavioral objectives answer the questions: Who, What, When, How, and To What Extent?

2. Product objectives - Product objectives identify a concrete item to be produced.

   Product objectives typically include the following information:

   - Who will produce the product?
   - What will be produced?
   - When will the product be produced or completed?
   - Who will evaluate the product?
   - How will the product be evaluated?

3. Process objectives - Generally, process objectives will not be used unless the process is very important and cannot be stated as a behavioral or product objectives. Process objectives include the following information:

  - What group (who) will perform the process?
  - What is the process?
  - What activity or performance will result from the process?
  - How will the process be evaluated?
  - When will the process be completed?

PERFORMANCE-BASED INSTRUCTION (BEHAVIORAL) OBJECTIVES: DEFINED

Instructional objectives tells what a successul learner is able to do at the end of the instruction or what the learner is to be like as a result of the learning experience.

Performance-based objectives and standards should be considered descriptions of the minimum levels of performance competency for successful entry level employment. Individual teachers may add objectives to the training or students may achieve far beyond the minimum stated levels and should be motivated to do so.

Students are held accountable to the stated standards when their achievement or performance is measured and certified. When a student has met at least the minimum specified performance level of an objective, the student receives credit for that mastery.

Especially in vocational education, some aspects of subject matter which lend themselves to behavior formation are taught most effectively within a behavioral framework.

IMPORTANT CHARACTERISTICS OF BEHAVIORAL OBJECTIVES

Several widely accepted characteristics of objectives include the following:

- The objective is a statement about a student (It is not a statement about a text or teacher.)
- It refers to the behavior of the student. It specified what the student is to know, and defines "knowing" by indicating how the student will demonstrate acquisition knowledge or skill.
- It is stated in terms of terminal performance: It is a description of the end product, but not the method of reaching the end product.
- It describes the conditions under which the student will perform.
- It indicates the level of performance necessary to achieve the objective (It may include a statement about the number of errors permitted and the speed of performance.).

The most important characteristic of a useful objective is that it identified the kind of performance that will be accepted as evidence that the learner has achieved the objective. A statement of an objective is useful to the extent that it specified what the learner must be able to do or perform when the learner is demonstrating mastery of the objective.

It is preferable to set limits on performance so that the student understands that the instructor does not want just any kind of performance. The instructor should specify exactly the type of minimum acceptable performance the student is to demonstrate.

In addition, objectives should be:

- Capable of being put into words (conceivable)
- Believable to the student, instructor, and others
- Achievable by the average student in the average instructional situation
- Written for a situation that can be controlled
- Measurable in time, quanitity...
- Actions that are desirable (that the student wants to accomplish, approved by the instructor and others)
- Stated with no alternatives
- Facilitating growth (not destructive to the student, others, or society)

The objectives for one level of instruction should be compatible with the expected entry performance requirements for the next level or sequence of instruction so that overlaps or gaps in vocational education will be minimized.

WHAT CONSTITUTES A PERFORMANCE OBJECTIVE?

A performance objective or minimum competency should be based on four items:

1. Be measurable
2. Be of appropriate scope
3. Be the responsible of the instructional program
4. Be of value

MEASURABLE:

A performance objective must be measurable on an individual basis. A pure performance test, however, may prove to be an expensive way of measuring if each student is able to function in a "real life" situation.

A measurable competency is a "broad, end-of-instruction" behavior that "subsumes many lesser, enroute skills." Typically, a measurable performance will consist of a set of skills (actions).

SCOPE:

The scope of a performance objective must be appropriate...neither too narrow or too broad. If the competency description is too narrow, it may not "bring together all of the subskills needed to perform the significant behavior." That is, the description may be one or more subskills raised incorrectly to the level of a competency.

If the performance objective is too broad, several sets of subskills may be observed indicating that the description actually involves several competencies. When the performance objective is too broad, there typically is a loss of clarity about what specific performance is desired.

The scope of the performance objective is very important because it determines the focus of the training...allowing the student to concentrate on achieving the more important behaviors to a satisfactory standard.

RESPONSIBILITY OF INSTRUCTION PROGRAM:

A performance objective or competency must be a part of the instructional program (within the responsibility of the school). If the performance is not the training responsibility of the school, the performance should be omitted from the minimum competency list.

VALUE:

A performance must have value. That is, it must consist of "genuinely significant skills which a student should possess."

Adopted from: Popham, W. James, and Lindheim, Elaine, Making Minimum Competency Programs Work, Los Angeles, CA: Instructional Objectives Exchange, pp. 1-7, 1979.

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PART VI

THREE ESSENTIALS OF WELL WRITTEN PERFORMANCE OBJECTIVE

A well written performance objective has the following three essential ingredients:

PERFORMANCE OBJECTIVE

PERFORMANCE	CONDITIONS	CRITERION
Very clear statement of exactly what the learner will be able to do after the mastery level is reached.	Any and all limits or circumstances under which the student will perform the objectives.	Minimum standard that the student must meet to be classified as having obtained mastery.

THREE ESSENTIALS OF AN OBJECTIVE

1. CONDITIONS under which the performance is to take place

   Ex: "Given a list of terms consisting of..."

2. BEHAVIOR DESIRED or expected of the student (things to be done, the performance desired)

   Ex: "...student will write a definition for each term..."

3. STANDARDS to determine how well the performance is to be done (criteria)

   Ex: "...with 95 percent accuracy in three minutes."

1. PERFORMANCE

"The PERFORMANCE part of an objective describes what the student will be doing. It must contain an ACTION VERB!"

An instructional objective describes an intended outcome of instruction, rather than an instructional procedures (rather than the process of instruction itself).

An objective always states a performance describing what the student will be DOING when demonstrating achievement of the objective (competency). It identified the terminal behavior by name.

The core of a well written objective is the VERB that is used such as "write," "list," or "classify" which indicates the kind of behavior required and is "less open to misinterpretation." The objectives describes what the student will be DOING when demonstrating the knowledge or skill performance mastered.

Relatively abstract verbs like "know," "understand," and "realize" are not suitable for stating behavioral objectives because they are subject to multiple meanings.

EXAMPLES OF ACCEPTABLE BEHAVIORAL VERBS

- write
- identify
- construct
- compare
- classify
- distinguish
- select
- measure
- recite
- solve
- list
- contrast
- calculate
- transcribe
- prepare
- locate
- evaluate
- revise
- adjust
- draw
- mend
- type
- insert

EXAMPLES OF VERBS NOT ACCEPTABLE

(These abstract verbs are subject to multiple meanings.)

- know
- enjoy
- foster
- understand
- appreciate
- realize
- learn

SELECTING THE APPROPRIATE VERB

USING ACTION VERBS REDUCES AMBIGUITY. UNLESS YOU SPECIFY STUDENT BEHAVIOR WITH AN ACTION VERB, THE STUDENT WILL PROBABLY END UP DOING SOMETHING ELSE.

ACTION VERBS IN VARYING QUANTITY

CRITERIA FOR VERBS SELECTION	POOR VERBS	BETTER VERBS	BEST VERBS
(verbs should be) observable measurable verifiable reliable	appreciate be aware of be interested in enjoy feel know understand	compare compute construct differentiate indicate operate predict recite solve write	add adjust checkoff fill in blank given (an example) group label state (a rule) turn

AVOID ABSTRACT VERBS WITH POSSIBLE MULTIPLE MEANINGS

- know*
- understand
- learn
- realize
- appreciate
- enjoy

*Knowledges are not directly observable. They involve mental processes which enable a person to use symbols. A person KNOWS something when they show they have use the symbols associated with it.

OVERT BEHAVIOR VERBS	COVERT BEHAVIOR VERBS***
(Directly visible or audible behaviors)	"Non-observable" (Cognitive, mental or attitude behaviors)
- listing - writing - singing - kicking	- identifying - recognizing - calculating - solving - adding - recalling

***If the main intent of the objective is a covert or non-observable behavior (mental, cognitive) then ADD an indicator behavior to help identify the main intent of the objective!

INDICATOR BEHAVIOR Implied behavior that tells what is the main intent of the objective.

An indicator behavior must be simple, direct, and within the knowledge of the student.

(Example)
"Select appropriate tools from given display..."

Select = Indicator Performance
(Main intent is to be able to recognize correct tools)

SELECTING THE APPROPRIATE VERB

EACH VERB GENERALLY IS RELATED TO THE KIND OF KNOWLEDGE INVOLVED.

General Rule: Simpler behaviors (associating, chaining, discriminating) require less practice than complex behaviors (classifying, rule using, problem solving).

<--------"less difficult behaviors"--"more complex behaviors"------------>

"concept behaviors"

ASSOCIATE

- identify
- specify
- indicate
- match
- mate
- label

MOTOR CHAINING (Sequence of Motions)

- adjust
- aline
- close
- disassemble
- disconnect
- duplicate
- insert
- lift
- locate
- measure
- open
- operate
- pull, push
- remove
- replace
- rotate
- tighten
- tune
- turn on/off
- twist

VERBAL CHAINING (Sequence of Words or Numbers)

- cite
- enumerate
- itemize
- list
- quote
- reproduce
- state, restate
- transcribe
- type, write
- tabulate

DISCRIMINATING (Identify Two or More Inputs)

- choose
- compare
- contract
- couple
- decide
- detect
- differentiate
- discern
- distinguish
- divide
- isolate
- judge
- pick
- recognize
- select

CLASSIFYING OBJECTS, PEOPLE, OR EVENTS

- arrange
- categorize
- classify
- collect
- compile
- file
- grade
- group
- inventory
- mate
- rank
- rate
- sort

RULE USING

- calculate
- calibrate
- check
- compute
- convert
- coordinate
- correct
- define
- demonstrate
- determine
- diagram
- estimate
- evaluate
- examine
- explain
- figure
- generalize
- illustrate
- interpolate
- interpret
- monitor
- plan
- prescribe
- project
- schedule

PROBLEM SOLVING

- adapt
- adjust to
- analyze
- compose
- construct
- create
- design
- develop
- diagnose
- find a way...
- invent
- reason
- resolve
- study
- think through
- troubleshoot

SOME ALTERNATE VERB CHOICES

Name

- label
- list
- record
- repeat
- give

Identify

- select
- mark
- pickout...
- choose
- locate

Describe

- define
- discuss in writing...
- interpret
- tell how, tell why
- explain

Order

- arrange
- sequence
- list (in order)
- classify
- isolate
- sort

Distinguish

- discriminate

Construct

- draw
- make
- build
- design
- formulate
- reproduce
- transcribe
- reduce
- increase
- figure
- cost

Demonstrate

- show your work
- show procedures
- perform an operation
- perform the steps
- operate
- turn off/on
- dis(assemble)
- dis(connect)
- remove, replace

BEHAVIORAL VERBS USED GENERALLY INFLUENCE TEST CONSTRUCTION

The type of test item to be constructed often is influenced by the objective.

Some objectives will require a performance to indicate mastery. Competency in other objectives may be tested by paper and pencil tests.

When the level of behavior concerns one of the following verbs, as ESSAY or COMPLETION test should be considered.

- describe
- state
- define
- determine
- calculate
- specify
- label
- list

When the level of behavior concerns one of the following verbs, a MULTIPLE-CHOICE or MATCHING test should be considered.

- select
- identify
- recognize
- indicate
- differentiate
- calculate
- match

The TYPE OF BEHAVIOR requested in the performance objective will influence the type of test constructed also. (See page titled "Selecting the Appropriate Verb.")

TYPE BEHAVIOR	TYPE TEST	
	RETENTION	TRANSFER
Associating	x	
Chaining	x	
Discriminating	x	
Performing Skilled Motor Acts	x	
Classifying		x
Rule Using		x
Problem Solving		x

2. CONDITIONS

The objective further defines the desired behavior by describing the important conditions under which the behavior will be expected to occur. This "given" information is a statement of the restrictions which will be imposed upon the student when the student is demonstrating achievement.

Conditions may describe: (a) equipment and supplies, (b) materials denied to student, (c) the setting in which the performance will be demonstrated, (d) information that will be provided to the student that will influence the performance, or (e) time allowed for the performance to be accomplished.

Sample Condition Statements

Equipment, supplies, or materials	- Given a set of blueprints... - Having available all equipment in the Food Service Laboratory... - Provided access to all references in the Drafting Lab...
Material denied	- Using only those materials provided... - Having available only that equipment which has been set up by the instructor...
Environment in which performance must be demonstrated	- In a simulated shop situation... - In a field situation...
Information provided that will direct his action in a certain direction	- Given a written situation and assignment... - Provided two menus and an inventory of storeroom supplies...
Specification of time	- Upon completion of the modules (unit)... - Upon completion of the course...

Condition statements in the objectives might read...

> "Given a list of 200 brief forms dictated at the rate of 1 brief form every 3 seconds..."
>
> "Using the Webster Word Speller, check..."
>
> "Using the Leroy type lettering devices, letter..."

3. STANDARDS/CRITERION

The third essential ingredient for an adequate instructional objective is to specify the criteria of acceptable performance by describing how well the student must perform to demonstrate proficiency. The specification of performance standards *usually includes a statement of acceptable accuracy and speed.* Explicit performance is necessary in order to determine the effectiveness of the instruction or learning.

The criterion describes the level of mastery or degree of proficiency necessary to carry out the performance and *probably is one of the most difficult parts of an objective to write.*

Ways to establish the criterion include: (a) accuracy within tolerance limits, (b) speed, (c) percent or number to be achieved, (d) reference to other material which identified specific criteria, (e) maximum number of permissable errors, (f) degree of excellence, or (g) a combination of *a* through *f*.

Sample Criterion Statements

Tolerance criterion	- within +/- .1 degree of instructor's reading - to +/- .001 inch as measured by a micrometer
Speed criterion	- completed within 5 minutes - ready for serving within 1 hour
Percent or number criterion	- with 90 percent correct responses - four out of five items must meet criteria for "finished products." - at the rate of two per hour
Compared to other criteria	- compared to the manufacturer's specifications - according to class (instructor) handouts... - according to the standards outlined in the text
Number of errors criterion	- with no more than three errors - with no more than one of the components not meeting "specifications"
Excellent criteria	- so that the weld will withstand 100 pounds of pressure - all criteria must be achieved at the good or excellent level...

Statements of STANDARDS in the objectives might read:

"...within a 20 minute period with 85 percent accuracy."

"...with 90 percent accuracy and neatness applies."

"...can define accurately 80 percent of the elements of graphic composition.

"...with 100 percent accuracy."

"...to entry level standards of industry."

SAMPLE BEHAVIORAL OBJECTIVES

The performance objective statement should be concise, in the present tense, and using an action verb.

Example 1

"On any automobile requiring routine maintenance brought into the
(condition statement)

automotive mechanics laboratory . . . grease . . . all critical
(performance)

points outlined in the manufacturer's service manual."
(criterion statement)

Example 2

"Given 30 envelopes and a mailing list, using an electric typewriter without a correcting feature, type the addresses on the envelopes using one of the chain feeding techniques, back or front, at the rate of at least 1 item per minute, correctly with no typographical errors."

(✓) "given" stated
(✓) action verb used
(✓) statement about a student's behavior
(✓) stated as a terminal performance (end product)
(✓) level of performance required is indicated

VALUE OF WELL WRITTEN OBJECTIVES

Including the three essential ingredients of performance, conditions, and standards in the behavioral objective will ensure that the objective is well written.

Well stated objectives, however, do not mean that instruction which meets them will be relevant or in some way valuable...only that the extent to which instruction achieves what it sets out to do may be readily assessed.

HOW MANY OBJECTIVES ARE ENOUGH?

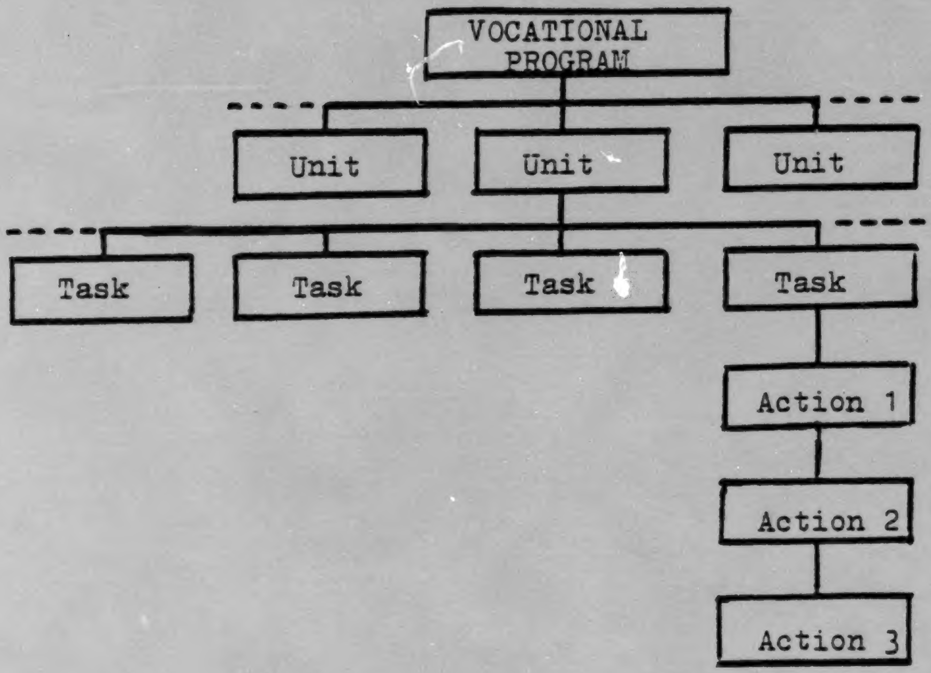
Generally, the more objectives, the more successfully the instructional content is communicated.

PART VII

IDENTIFYING PERFORMANCE ACTIONS

PERFORMANCE ACTIONS: DEFINED

Upon completion of the task description, an overall job description including the vocational program objectives, and the task list, the major performance objectives or jobs in the occupation, the next step in developing the performance objectives or jobs in the occupation, the next step in developing the performance-based instruction guide is to identify the series of actions (set or sets of skills or functions, activities, or steps) required of the student (worker) while demonstrating the task objective has been attained.



Performance actions describe the steps, activities, or sets of skills necessary to accomplish a performance objective (task).

- - 2

IDENTIFYING PERFORMANCE ACTIONS

Specify performance objectives (tasks) by:

1. Detailing the actual steps (actions) necessary to perform the task, and
2. Determine the importance of each step.

1. To Detail Performance Actions:

   Arrange the task steps or actions in a logical (educationally) or sequential order of performance if the order of performance is important (a) to the accomplishment of the task or (b) to learning the task.

   Include all steps essential to accomplishing the task.

   Each step should be distinct and separate and actions should not overlap.

   Include enough detail in the performance action description so that the student could accomplish the task by following the performance actions outline.

   When detailing performance steps, WATCH FOR the following:

   a. Inappropriate levels of detail such as:
      - too little detail, too general (i.e., Adjust the carburetor.)
      - too much detail (i.e., Obtain an allen screwdriver from the tool box.)
      - Excessive detail (i.e., Locate the allen screwdriver in the left section of the upper tray of the tool box.)

   b. Essential steps omitted from the description.

   Periodically, job actions and tasks change or outlines of performance actions may omit important steps.

   c. Steps that are no longer applicable.

      For example, advances in automotive technology have invalidated some previously established task actions when applied to late model automobiles.

2. Three criteria may be used to determine the importance of task actions.

   a. Frequence of performance

b. Importance of the activity in terms of the potential consequences (negative or positive) of the student's NOT being capable of performing the activity (i.e., If the student cannot perform the activity, will it prevent reaching the objective?).

c. Learning difficulty

To describe the set of actions that a student must perform to accomplish a task, determine;

- what component skills the task involves,
- the relationship of those components, and
- how each component fits into the total task.

A simple task will have few components. A complex task will have many components or actions.

Some performance actions or steps will be included in the task, but will not be visable while they are being performed. For example:

- Identify the sequence of steps that must be followed to perform them correctly
- Describe how...works
- Describe the theory of why...works
- Recognize the dangers associated with performing the task
- Recognize the differences between a properly performed task and an improperly performed task

As necessary, identify the essential steps of a job by the process of task analysis (See Workshop Guide I).

PART VIII

GUIDELINES FOR ESTABLISHING VALID PERFORMANCE STANDARDS

The Handbook for Designers of Instructional Systems (Objectives and Tests), Volume III, suggests that "the criterion behavior should be as close as possible to the job behavior."

There may be many other important, supportive learning behaviors necessary to obtain the objectives; however, they are not the criterion behavior.

SOURCES OF STANDARDS

In the development of articulated, performance-based instruction guides, standards generally will be developed from five major sources. These five key sources are:

1. Mandated minimum standards such as requirements of the State Department of Education, etc.
2. Minimum standards recommended by industry (task analysis) or by Curriculum Advisory Committees.
3. Articulated Task Force Committee originated minimum standards.
4. Instructor standards that may exceed or supplement the minimum standards.
5. Articulated optional standards.

DETERMINING THE DEGREE OF DIFFICULTY IN STANDARDS

The degree of difficulty of a performance standard may be determined by the following methods.

1. Competency level of persons on the job (in the craft).

   This method involves identifying workers (craftsmen or vocational program graduates who are successfully performing the job and surveying them probably using the "task analysis" process.

2. Expert opinion (such as mutually agreed upon options of vocational instructor task force committee participants)

   This method relies heavily on the judgment of one or several experts. The judgment is only as good as the knowledge of the particular task held by the experts.

The percentage of accuracy for mastery in tasks included in the articulated, performance-based instruction guides typically will be determined by the expert judgment of the task force committee developing the guide or by a curriculum advisory committee.

CRITERIA FOR GOOD STANDARDS

The Handbook for Designers of Instructional Systems (Objectives and Tests), Volume III, outlines the "criteria" for good standards as "completeness and accuracy."

Competency (mastery of objectives) is determined by two facets:

1. Degree of difficulty of the cognitive content of the skill to be mastered.
2. Range of tolerance of performance permitted in determining competency (e.g., 90 percent accuracy).

CRITERIA FOR STANDARDS	NATURE OF MASTERY DESCRIBED
COMPLETENESS	Exact nature of performance competency. How the competency must be demonstrated. Steps, sequence of actions, production, etc., necessary in competency. Quantitative statements concerning performance
ACCURACY	Degree of correctness, accuracy, preciseness. Tolerances allowed. "Values or dimensions" of competency.

Concept from Handbook, Vol. III, pp. 2-5.

SIX POSSIBLE CATEGORIES OF STANDARDS

STANDARDS MAY BE DESCRIBED BY	EXAMPLE
Operating Procedure	Given a vehicle with a leaking pinion seal, access to the proper hand tools, equipment, necessary parts, and a service manual; replace the pinion seal ACCORDING TO AND FOLLOWING THE EXACT PROCEDURES IN THE MANUFACTURER'S SERVICE MANUAL.
No Error	Given a problem which includes lines to be centered or spread centered, type the problem ACCORDING TO THE INSTRUCTION GIVEN IN THE TEXT WITH 100 PERCENT ACCURACY.
Minimum Level of Performance	Using a 12 foot tape rule, measure the length of two pieces of given stock and write your answers TO THE NEAREST 1/16 INCH.
Time Requirements	Given a list of 50 brief forms dictated at a rate of 1 every 5 seconds, ACCURATELY write and transcribe AT THE TYPEWRITER OR BY HAND WITHIN 15 MINUTES WITH 90 PERCENT ACCURACY.
Rate of Production	Given a rough draft manuscript, type the manuscript with all errors corrected at a MINIMUM OF 2 PAGES PER 50 MINUTES CLASS PERIOD.
Qualitative Requirements (typically is not qualified)	Given the necessary tools, equipment, parts, and service manual, and an automobile air conditioning or heater system needing a fan motor replaced; replace the fan motor ACCORDING TO THE MANUFACTURER'S SERVICE PROCEDURES SO THAT THE MOTOR OPERATES CORRECTLY AT ALL SPEEDS WITH NO RATTLES.

Concept borrowed from Handbook, Vol. III, pp. 2-6.

GUIDELINES FOR DETERMINING STANDARDS

JOB CONDITIONS (from Task Analysis)	RECOMMENDED STANDARDS	CRITERION STATEMENT MIGHT REFER TO	SAMPLE CRITERION STATEMENT
Complex performances with definite procedures, sequence of actions, or standards prescribed	Procedures of performance	Manufacturer's, technical or other manuals, guides, etc., with written or established procedures or limits	"...following manufacturer's recommended procedures." "...in the proper sequence outlined in given handouts." "...acceptable procedures must be used."
Performances that require 100 percent accuracy or that allow no errors	No error, 100 percent accuracy	Performance demonstrated must be without errors, 100 percent correct	"...with 100 percent accuracy." "...all items must receive an acceptable rating." "...must be straight with no undercut."
Activity where time is an essential factor	Time statement	Time required/allowed for demonstration of performance	"...with 95 percent accuracy within 15-25 minutes." "...in 30 minutes with 100 percent accuracy..."
Activity where production is an essential factor	Production Rate	How much production or how may products must be achieved in the given time	"...minimum of 2 pages accurately typed per 50 minute class period."
Tasks that are not easily quantified	Qualitative	Exactly what must be observed or inferred by the observer/instructor	"...to the standards of the instructor." "...operated satisfactorily at all speeds with no rattles.
Tasks that emphasize a concept understanding	Percentage of correctness	Minimum percent of correctness to demonstrate competency in discriminating between concept examples and non-examples	"...with 100 percent accuracy." "...95 percent accuracy in figuring depreciation by the most appropriate of the three common
Tasks where some degree of performer independence is important	Specification of supervision: - no help - some help - continuous help	What degree of supervision is allowed, will it be imposed or requested, and who will supervise	"...without instructor assistance..." "...without the assistance of other students."

Concept from Handbook, Vol. III, pp. 2-7.

PART IX

ADVANTAGES AND DISADVANTAGES OF PERFORMANCE-BASED OBJECTIVES

PERFORMANCE OBJECTIVES

In the Occupational Education Articulation Program, performance objectives represent the major tasks or activities of an overall job or training unit. Tasks may make up units which in turn represent a vocational program or tasks may constitute the program.

All performance objectives are not of equal importance in the accomplishment of a job. Tasks that are not performed frequently may not represent a critical skill. Consider if a task is easy, moderate, difficult, or if it generally is practiced every day, once a week, monthly, or only periodically.

It is likely that some students will be able to perform some tasks when they arrive for vocational training. One instructional goal is not to bore the student by teaching what already is known to the student. We, however, want the student to perform the tasks that the student can do already as part of the entire set of task actions.

IMPORTANCE OF PERFORMANCE-BASED INSTRUCTION OBJECTIVES

1. Performance-based instruction objectives make it possible for the student to identify the required terminal performance.

   The student can define the goal of the vocational education program.

2. It keeps the student on track (it is a logical, sequential development).

3. It avoids content not necessary to reach goals.

4. It starts at the right place.

5. It stresses the actual tasks involved on-the-job.

6. Knowledge areas or skills are divided into small steps... each progressing toward an objective.

7. It makes students aware of the elements of the learning situation.

8. It makes it possible to achieve high recallability of learning sets (actions, sets of skills, steps toward an objective).

9. It is easier to guide the student's thinking on how to solve the task or reach the objective.

HAZARDS IN USING BEHAVIORAL OBJECTIVES

To make sure that we use behavioral objectives effectively, it is important to be aware of possible hazards of behavioral objectives.

1. Behavioral objectives that are not carefully developed and well written, may be trivial.

   Writing objectives describing student behaviors that demonstrate skills and knowledges of specific facts is easier than writing objectives describing behaviors that demonstrate the student's ability to think and reason.

   "Unless we can write objectives that deal with more important goals of learning in terms of student's behaviors, we may be forced to deal with vague generalities that are of little value."

2. A list of objectives may become encyclopedic. There is little evidence to indicate that completely programmed courses achieve many of the more important goals of education.

   (In the Vocational Articulation Project, however, we are writing objectives for highly tangible skill and knowledge areas of vocational training.)

3. "There are too many examples of objectives at the lower levels of the cognitive domain, and too few examples of objectives in the affective domain."

   There "is need for more work on writing objectives for the higher levels of the cognitive domain, as well as much more work on writing objectives in the affective domain."

4. Developing a catalog of objectives could limit the goals of teaching.

   "At present, it is not possible to write behavioral objectives for all of the educational outcomes that are desired."

5. While writing behavioral objectives becomes easier and more rapid with practice, it REQUIRES TIME to accurately describe the training objective with precision.

6. In addition, there often is an "influence gap" that exists between the desired objective (the behavior that is accepted as evidence of its attainment) and the development of a valid measure of its attainment.

Adopted from: Albert F. Eiss, "Performance Objectives," National Association of Secondary School Principals Bulletin, v. 54, No. 342 (January, 1970), pp. 51-57.

PITFALLS TO AVOID IN USING PERFORMANCE-BASED INSTRUCTION

1. "It Won't Work Trap"

   The most important determinant of the success of performance-based instruction is the instructor's belief in the work of the instructional system. The better the vocational instructor knows the system, the better the plan will succeed! Instructors may find it beneficial to increase their knowledge of performance-based instruction through reading from sources included in the references of the workshop publications of from professional discussions with others involved in similar activities.

2. Negative Trap

   The power of positive thinking is a key to successful implementation of performance-based instruction. An instructor that believes that student and school problems are so extensive that nothing can be done about them probably will develop and implement a performance-based instruction plan that does not reach optimum success.

3. Idealism Trap

   No single instructor will save the world. Performance-based instruction should reflect only "high-impact, realistic" goals.

4. Talk Trap

   It is most important that potential employers, higher education, instructors, students, and others have input into developing performance-based instruction if the vocational program is going to serve the needs of both students and employers to the optimum. The input, however, should concentrate on important issues that each contributor can offer.

5. Activity Trap

   Performance-based instruction should include only tasks and activities that have high impact in preparing graduates for successful entry level employment. Instructor added objectives should be structured so that they are realistic, affect students in positive ways, and contribute to program goals.

   The performance-based instruction plan should be regularly reviewed and objectives or activities that do not have high impact on the needs of students should be revised. Activities that do not significantly contribute to instructional goals should be omitted. Daily instructional activities should support and contribute to the accomplishment of program goals.

Adopted from: The Vocational Counselor and Management by Objectives, Bismark, ND: State Board for Vocational Education, ca 1976.

PART X

"SAMPLE" PERFORMANCE OBJECTIVE, PERFORMANCE ACTIONS, AND STANDARDS

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Sample A

MODULE 3.0 DRAFTING I

TASK 3.07 USE OF THE DRAFTING MACHINE

PERFORMANCE OBJECTIVE:

Given the arm or track type of drafting machine, identify how the drafting machine replaces the straightedge, triangle, scale, and protractor and how the machine reduces drafting time. Demonstrate the basic operations of the two types of drafting machine to the instructor's satisfaction.*

NOTE: *Performance actions may vary depending upon the number of drafting machines available to the student. Some drafting classrooms have demonstration drafting machines while other drafting classrooms may be fully equipped with drafting machines. The minimum objectives is familiarization with the two types of drafting machines.

PERFORMANCE ACTIONS:

3.0701 Demonstrate the basic mechanical operations of the arm drafting machine. (Similar, appropriate performance actions apply to track drafting machine.)

a. Mounting, anchor adjustment
b. Protractor Head operation
c. Inserting scales
d. Setting scales:
    (1) Using thumblock on anchor, line up lower scale with top or bottom edge of drawing board.
    (2) Draw reference line along lower scale, near center of board. Adjust scale as required.
    (3) Swing protractor head to minus 90° and align upper scale with reference line. Adjust scale as required.
    (4) Adjust to an established baseline.
e. Square the scales.
f. Park the drafting machine.

3.0702 Using the arm or track type of drafting machine, draw given exercises to demonstrate ability to use the machine.

SUGGESTED INSTRUCTION TIME: 2 Hours

PERFORMANCE STANDARDS:

- Student will demonstrate the basic operation of the two types of drafting machines in practical exercises of drafting, given assignments by the instructor.

Sample B

UNIT 4.0 WELDING I - OXYACETYLENE

TASK 4.05 SET UP OXYACETYLENE CUTTING/WELDING STATION

PERFORMANCE OBJECTIVE:

Given oxyacetylene torch, regulators, hoses, check valves, cylinder wrench, oxygen, and fuel cylinders and portable cart; set up a portable or stationary oxyacetylene cutting/welding station. The oxy-fuel equipment will not leak and will operate safely as the manufacturer intended.

PERFORMANCE ACTIONS:

4.0501	Chain cylinders to cart.
4.0502	Remove cylinder cap.
4.0503	Crack cylinder valves to clean out foreign particles and inspect threads.
4.0504	Attach regulators.
4.0505	Install check valves.
4.0506	Attach hoses.
4.0507	Attach hoses to torch. (Set proper pressure for tips being used.)
4.0508	Check for leaks.

PERFORMANCE STANDARDS:

- Oxy-fuel equipment will not leak and will operate safely as the manufacturer intended.
- 90 percent minimum on knowledge test concerning cylinder handling, regulators, and set-up of oxy-fuel welding equipment.
- Set up oxyacetylene cutting/welding station to instructor's standards.

SUGGESTED INSTRUCTION TIME: 3 Hours

RELATED TECHNICAL INFORMATION:

- Safety:
  - a. Cylinder storage and handling
  - b. Purging equipment
  - c. Gas: (1) Pressures, (2) Ventilation
  - d. Inspection procedures
- Manufacturer's specifications and instructions.

Sample C

UNIT 5.0 ARC WELDING

TASK 5.05 STRIKING AND MAINTAINING (SUBSTAINING) AN ARC (FLAT POSITION)

PERFORMANCE OBJECTIVE:

Given instruction, safety protective equipment, welding machine-equipment-accessories, and 1/8" E-6010 electrodes, and mild steel training plate, strike and maintain an arc to the instructor's standards.

PERFORMANCE ACTIONS:

5.0501 Prepare for welding. (Take safety precautions included.)

5.0502 Set up given arc machine-equipment-accessories.

5.0503 Position plate.

5.0504 Correctly position electrode in holder and grip holder for welding.

5.0505 a. Strike and maintain an arc. (Use scratch, tapping, etc., method to produce acceptable arc.)
b. Adjust for proper heat.

PERFORMANCE STANDARDS:

- Strike and maintain an arc to the instructor's standards.

SUGGESTED INSTRUCTION TIME: 15 Hours

RELATED TECHNICAL INFORMATION:

- Operation of arc machine-equipment-accessories.
- Safety precautions.
- Electrode identification.

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APPENDIXES

Appendix A	Suggested Timetable
Appendix B	Workshop Agenda
Appendix C	Survey

SUGGESTED TIMETABLE

WORKSHOP

"Writing Performance-based Objectives, Performance Actions, and Standards..."

Date:

Location:

TIMETABLE:

8:30 a.m.	Workshop begins
9:30 a.m.	Review of Participant's Guide (Xeroxed Handout)
	Review of sample products
	Questions concerning writing performance-based objectives, actions to reach the objectives, and standards
	Organization of working sessions
	Working Session begins
11:30 a.m.	- 12:30 p.m. Participants are on their own for lunch
12:30 p.m.	Working session resumes
3:10 p.m.	Review of accomplishments of session
	Questions concerning writing objectives, actions, and standards
	Task description for next meeting (for participants)
	Suggested preparation work for next meeting (volunteer assignment of outside work by Task Force Group if participants are willing)
	Scheduling of next meeting (suggested date, time, and location)
	Statement of what to bring to next meeting
3:30 p.m.	Workshop and working session concludes

This workshop is based on a six (6) hour working day for teacher secondary level teacher participants.

WORKSHOP AGENDA

"Writing Performance-based Objectives, Performance Actions, and Standards..."

1. Greeting, registration of Task Force Committee participants (8:30 a.m.)
2. In-service credit announcement
3. Orientation to purpose of Workshop (Writing program description, performance objectives, performance actions, and standards for performance-based instruction material)
4. Workshop outline
5. Tasks of Task Force Committee(s)
6. Workshop "Participant's Guide" (approximately 9:00 a.m.)
    a. Guide distributed
    b. Review of guide by tape recording
7. Samples displayed and reviewed
    a. Program description
    b. Performance objective(s) or Task Listing
    c. Performance actions
    d. Standards

    (use a completed unit, if available)
8. Questions
9. Organization of Working Session
    a. Divide into groups, as appropriate
    b. Restatement of specific task of Committee(s)
10. Working Session

    (There will be a lunch break at 11:30 a.m. to 12:30 p.m. with participants on their own for lunch,)
11. Assignment of tasks for next meeting
12. Scheduling of next meeting(s)

Appendix C

SURVEY

(Task Force Committee Participants)
Occupational Education Articulation Program

The Occupational Education Articulation Program is preparing to initiate a new phase of articulation which will include your vocational program.

To accomplish the objective of developing an articulated, performance-based instruction guides a "task force committee" of which you will be a member will meet periodically to draft the curriculum description.

The "task force committee" meetings may include:

(a) Release time from classroom responsibilities (Occupational Education Articulation Program pays your substitute)

(b) Participation on your own time for which you will be paid a stipend

WE NEED TO SCHEDULE MEETING TIMES WHICH WILL BE CONVENIENT TO THE GREATEST NUMBER OF TASK FORCE COMMITTEE PARTICIPANTS!

DIRECTIONS:

KINDLY COMPLETE THE FOLLOWING SURVEY. RETURN IT IN THE ENVELOPE PROVIDED NO LATER THAN: ______________
Survey Due Date

1. If released from classroom duties during the regular school week to participate in task force committee meetings (substitute paid by Program), which is the best day (in the week) for you to attend the committee meeting?

   ☐ Mon. ☐ Tue. ☐ Thur. ☐ Fri.

2. During the school year, but after the school work day (on your own time), when would you be willing to participate in task force committee meetings (to be paid for participation)?

   (Check all applicable.)

   ☐ directly after end of regular school day from...

      ☐ 3-4 p.m. ☐ 3-5 p.m.

   ☐ weekday evenings (say 7-9 p.m.)

      ☐ Mon. ☐ Tue. ☐ Wed. ☐ Thur. ☐ Fri.

   ☐ Saturday: ☐ Morning ☐ Afternoon ☐ Both

3. During the summer months (June-August), when would you consider participating in task force committee work (you will be paid by Occupational Education Articulation Program)?

   - ☐ immediately after the regular school year ends (June), for several consecutive days
   - ☐ immediately before the regular school year begins (August), for several consecutive days
   - ☐ one week during the summer for several consecutive days (June-August)
   - ☐ one day a month, during the summer months (June-August)

4. Are you now using any printed curriculum guides such as the 1970 curriculum guides issued by the South Carolina State Department of Education or the V-TEC Catalogs?

   - ☐ Yes
     - ☐ SC State Department of Education Curriculum Guide
     - ☐ V-TEC Catalog
     - ☐ Others (describe) ______________________________
   - ☐ No printed guide presently used or available

Kindly complete this survey in full and return it in the envelope provided no later than the due date.

Return to:

Occupational Education Articulation Program
The School District of Greenville County
c/o Donaldson Vocational Center
Donaldson Center
Greenville, SC 29605

WORKSHOP GUIDE III

DEVELOPING OUTCOME-REFERENCED TESTS

by

Wm. Edward Henderson Jr.

May, 1983

DISCRIMINATION PROHIBITED

Title VI of the Civil Rights Acts of 1964 states: "No person in the United States, shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefit of or be subjected to discrimination under any program or activity receiving federal financial assistance." The Occupational Education Articulation Program is operated in compliance with this law.

The opinions expressed herein do not necessarily reflect the position or policy of the funding or sponsoring organizations and no official endorsement by those organizations should be inferred.

BIAS STATEMENT

Articulated, performance-based instruction guides are developed based upon tasks (objectives) important to the success of entry level workers. The objectives are derived from task analysis and available tasks lists such as V-TEC Catalogs. Standards of performance are those expected by local businesses and industries for job success. Test samples are included to represent valid and reliable measures of vocational competency.

Articulated, performance-based instruction documents are designed to comply with the requirements of PL 94-482 Educational Amendments of 1976, Title II, which is intended to "...ensure that...curricula do not reflect sterotypes based upon sex, race, or national origin..."

COPYRIGHTED DISCLOSURE STATEMENT

Every effort has been made to appropriately document any copyrighted material used in this articulated, performance-based instruction document.

Many ideas and models, however, have evolved from years of research and experience and often are difficult to precisely credit.

The objectives and task actions of the articulated guides are developed or contributed by task force committee (instructor) participants based on their expertise and on task lists from resources such as V-TEC Catalogs. Standards included in guides are those identified by local potential employers as important to the success of entry level workers. Sample knowledge and performance tests are included to represent valid and reliable test items that may be used to measure mastery of objectives. Test samples taken from texts or workbooks typically are those being used locally and appropriate documentation has been included.

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The School District of Greenville County
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1983

Henderson, Wm. Edward, Jr., Workshop Guide III: Developing Outcome-referenced Tests, Greenville, SC: Occupational Education Articulation Program of The School District of Greenville County and Greenville Technical College, May, 1983.

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PREFACE

Design of Articulated, Performance-based Instruction Guides

The articulated, performance-based instruction guides should be designed to answer three critical questions necessary for quality vocational instruction:

What should be taught?
How should it be taught?
How should students be evaluated?

The premise of *Workshop Guide II, Developing Outcome-referenced Tests*, is that vocational students should be evaluated using a validated, competency-based approach to determine proficiency in vocational knowledges and skills.

The minimum standards for competency are those required for successful entry into the next higher level of education or for successful entry level employment.

Purpose of Workshop Guide III

Workshop Guide III is not designed as a text on measurement and evaluation nor is it the latest, last, or best work on test item development.

The information included in *Workshop Guide III* is assembled and distributed to instructor task force committee (writing team) participants in the Occupational Education Articulation Program *to promote standardization* in outcome/criterion-referenced test development.

To obtain maximum benefit from *Workshop Guide III*, you first should review:

Introductory "Fact Sheet" on Articulation Program
Workshop Guide I, Suggestions for Conducting a Task Analysis and Some Ready-made Sources of Task Lists
Workshop Guide II, Preparing Objectives, Performance Actions, and Standards

The identification of valid training objectives is a first step in the development of a valid competency test. Sometimes, the performance objective and the competency test may be the same. Typically, however, the test instrument will be more sophisticated than the objective statement and will have to be designed.

Workshop Guide III outlines outcome-referenced measurement and test item construction in general, "how-to" terms. Diagrams, charts, and sample tests are included to make the instructor's job or writing/selecting valid test items as simple and as productive as possible.

Greenville, SC

W. E. H.

"We do not weigh steam with a yardstick or evaluate music with a bathroom scale. Such measures would be irrelevant to the thing being measured. Similarly, we do not measure achievement of objectives with test items that do not match. When one wants to know whether his instruction is as successful as he intends, he must use procedures that are suitable to the task."

- Mager, Robert F., Measuring Instructional Intent, Belmont, CA: Fearon Pitman Publishers, Inc., 1973.

PART I

THE TASK
OF THE TASK FORCE COMMITTEE

OBJECTIVE OF ARTICULATED INSTRUCTION GUIDE

The objective of the articulated, performance-based instruction guide (curriculum description) is to provide the vehicle by which lateral and vertical articulation may be accomplished.

The focus in the performance-based curriculum description is on preparing the student to exit the vocational education program with the demonstrated knowledges and skills necessary to be successful in entry level employment.

TASK OF WRITING TEAM

At the initiation of the writing of outcome-referenced tests, the task force committee already should have developed most of the vocational program performance (task) objectives, performance actions (enabling objectives), and performance standards. In addition, the suggested instruction time for each performance objective should be estimated. This estimated instruction time indicates the complexity or importance of each objective.

The next step in developing the articulated, performance-based instruction guide is to design valid outcome-referenced test samples by which the student's vocational competency may be evaluated.

EVALUATION IS ESSENTIAL

Evaluation of vocational education is essential in helping answer the following questions concerning instruction.

- Were the developmental objectives achieved?
- Were the methods of instruction effective?
- Were the best, most economical instructional activities used?
- How effective was learning?
- Was there the desired change in behavior of the learner?

Often, tests are too academic for vocational training or do not measure instructional intent. To answer these important questions concerning the vocational program, it is important to employ the best methods of evaluation.

DEFINITIONS

The following definitions adopted from Robert F. Mager (*Measuring Instructional Intent*, 1973) will help build a framework for articulation concerning measurement and evaluation.

Item	A single stimulus or stimulus pattern that calls for a single response or set of responses. The response may be simple or complex. "It is one sample of behavior or performance."
Test	An activity where the student is asked to demonstrate some aspect of knowledge or skill. It can be a single test item, but usually it consists of several items.
Measurement	Measurement is the process of determining the extent some characteristic is associated with the student.
Evaluation	Evaluation is when we compare a measurement with a standard and pass judgment on the comparison.
Outcome-referenced test	(Defined on the following pages.)

PART II

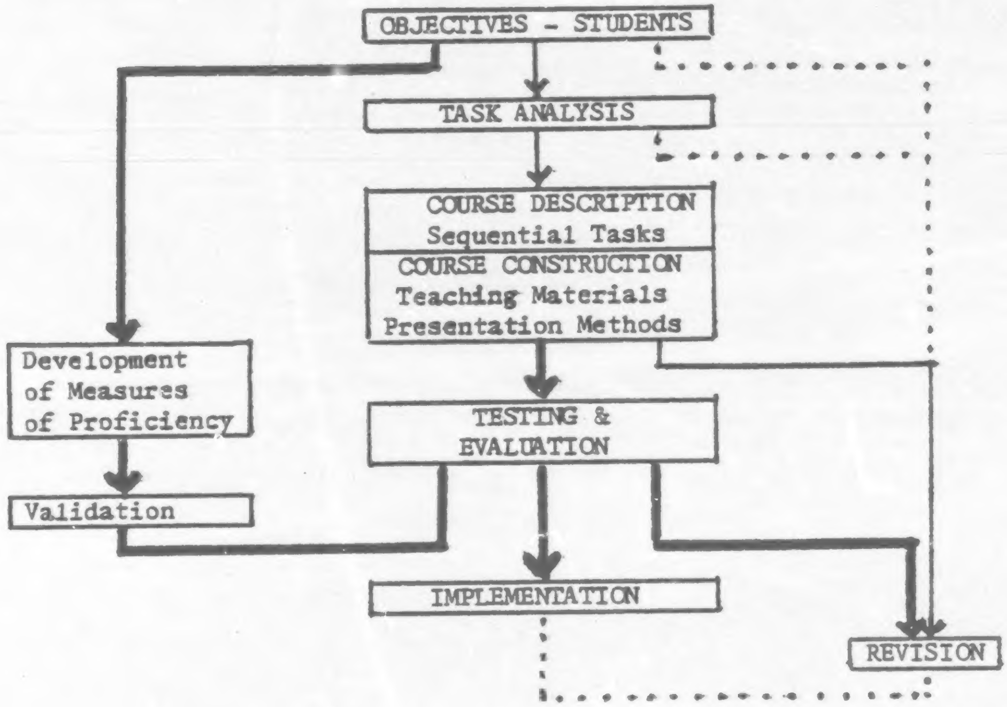
EVALUATION IN THE SYSTEMS APPROACH TO INSTRUCTION

The function of any evaluation is to assist in decision making.

The systems approach to vocational education starts with a definition of behavior change objectives and a statement of the purpose(s) of the vocational instruction. This definition (objective statement) remains the criteria for evaluation throughout the course and achievement against the stated goals is the measure of success.

Evaluation should be limited to accurately measuring how much of the desired behavior was attained and applied in the classroom.

SYSTEMS APPROACH


OBJECTIVES - STUDENTS
TASK ANALYSIS
COURSE DESCRIPTION
Sequential Tasks
COURSE CONSTRUCTION
Teaching Materials
Presentation Methods
Development of Measures of Proficiency
Validation
TESTING & EVALUATION
IMPLEMENTATION
REVISION

Schematic: Systems approach to instruction. The actual system may vary with the program, institution, or individual instructor.

PART III

NORM- AND OUTCOME-REFERENCED EVALUATION

NORM-REFERENCED EVALUATION

In norm-referenced evaluation, measures are dependent on a relative standard. Measures compare the capabilities of one student to those of other students.

Norm-referenced measures may tell us that one student is more proficient than another student, but they do not provide much information about the degree of proficiency in relationship to the tasks involved.

OUTCOME-REFERENCED EVALUATION

Outcome-referenced measurement (or criterion-referenced measurement) depends on an absolute standard of quality.

Outcome-referenced measures provide a standard of achievement for the individual as compared with specific behavioral objectives and therefore provide information about the degree of competency attained by the student.

The most relevant and reliable measures available should be chosen to examine the stated objectives of the training. Objective measures, for example the rate of production, especially are vunerable to influences of opportunity bias, whereas subjective measures are affected by the difficulties of the instructor rating the student without bias.

In order to properly evaluate vocational training, it is necessary to obtain outcome-referenced measures that provide information about the skill level of the student in relationship to expected achievement levels of the program.

Norm-referenced data that indicates that a student is equal to or above 60 percent of the population provides little information about the student's specific capabilities; thus it is difficult to design modifications to improve the training program for the student.

In outcome-referenced evaluation, the purpose is to make sure that the item or items of the test match the stated objective in (1) performance and (2) condition.

Each test item will be accepted or rejected on the basis of whether the objective defines or includes the behavior asked for in the test item. The objective must be stated clearly enough to be useful!

In the guide concerning writing objectives, it was mentioned that well stated objectives do not mean that instruction which meets them will be relevant or in some way valuable, only that the extent to which it achieves what it sets out to do may be assessed readily.

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NORM-REFERENCED AND OUTCOME-REFERENCED EVALUATION

The following are some of the more important differences between norm-referenced and outcome-referenced measurement.

	OUTCOME-REFERENCED	NORM-REFERENCED
Frame of Reference	The outcome-referenced measure is a comparison with a preset standard (established by the outcome desired).	The norm-referenced measure is a comparison with a group measure (indicates relative achievement).
Purpose	The purpose of an outcome-referenced measure is to assess whether the student has mastered a specific performance standard.	The main purpose of a norm-referenced test is to determine a student's relative position within a normative group.
Objectives Specified	Complete instructional objectives are specified in the construction of outcome-referenced tests.	Either general conceptual outcomes (usually done) or precise objectives may be specified when constructing norm-referenced tests.
Criterion for Mastery	The outcome, criterion for mastery (instructional objectives), must be stated in outcome-referenced tests.	The criterion for mastery usually is not specified when using norm-referenced tests.
Items	Test items are constructed to measure a predetermined level of proficiency. Items are generated as indicators of the specific behavior named in the outcome.	Test items are constructed to differentiate among students. Items are sampled from a domain (or universe) of knowledge.
Variability	Variability of scores is irrelevant to interpretation: It is not a necessary condition of a satisfactory outcome-referenced test.	Variability of scores is a desirable aid to meaningful interpretation.
Grading System	Test results from outcome-referenced measurement suggests the use of a binary grading system (i.e., satisfactory/unsatisfactory, +/-, etc.). The test results can be translated into a traditional grading system.	Test results are are more easily adapted to the traditional grading system.
Questions	What can the student do?	How much does the student know in comparison to other students?

PART IV

SELECTING THE BEST PROFICIENCY TEST

GENERAL

PERFORMANCE TESTS appear to be the most reliable method of measuring vocational competency. Performance tests, however, sample a narrow subject area. When a broad sample of competency is desired, knowledge tests probably should be employed.

A less valid but still reliable indication of competency is the OBJECTIVE TEST.

SUBJECTIVE TESTS items are unreliable in indicating competency and predicting job sucess.

Objective knowledge (pencil and paper) tests are suitable for measuring some vocational competencies (behavior).

TYPES OF OBJECTIVE TESTS

Typical types of objective tests include:

- Multiple-choice
- Matching
- Completion
- True-False
- Production

Some types of knowledge tests are more objective than others (See chart below).

DEGREES OF OBJECTIVITY

OBJECTIVE	LESS OBJECTIVE	SUBJECTIVE
Multiple choice	Production (case studies or problems) --when answers are specific and not subject to interpretation	Essay--where the student is required to discuss a topic
Matching		
Completion--when answers are short, requiring a specific word/phrase		Completion--where answers can be phrased in various ways
True-false--when indisputably factual or not factual		True-false--where dependent on content
BEST CHOICE		POOR CHOICE

USING KNOWLEDGE TESTS IN PERFORMANCE-BASED EDUCATION

Although paper and pencil (knowledge) tests typically are less valid than performance test, *when properly used they can be useful in measuring* the *knowledge components of a task*.

Knowledge tests, which typically are only *indirectly* related to job performance and success, should be validated.

One method of determining validity in a knowledge test is to compare the test with a directly valid measure of performance. If it compares favorably, you may conclude that the knowledge test is *indirectly valid* in predicting job performance.

ADVANTAGES AND LIMITATIONS
OBJECTIVE AND SUBJECTIVE TESTS

CRITERION	OBJECTIVE TESTS		SUBJECTIVE TESTS	
	Advantages	Limitations	Advantages	Limitations
Objectivity	Major advantage.	--------------------	--------------------	Major limitation.
Validity	If objective test items match objectives, validity can be a major advantage.	If test items do not match objectives, validity can be questioned.	Can be valid if standards and criteria for assessment are specified.	If standards and criteria for assessment are not specified, validity can be questioned.
Reliability	Major advantage if test items are well-written and precise.	"Vaguely worded test item, open to interpretation, are not reliable."	--------------------	A subjective test often lacks reliability.
Comprehensiveness	Major advantage (permit a wide sampling of knowledge).	--------------------	--------------------	Major limitation.
Convenience	Easy to administer and score.	Writing an objective test is time-consuming.	Writing a subjective test takes a relatively short time.	"Time-consuming to score."

Source: Testing Instructional Objectives, Module 9, Vocational Education Curriculum Specialist, Washington, DC: U. S. Government Printing Office, 1976.

RETENTION OR TRANSFER TEST?

It is not uncommon to find a student who has done well on a written test, but is not able to solve new problems on the job. The test apparently measured retention, but failed to indicate if the student could transfer the skill and knowledge being tested to another situation.

It is from such situations that educators and the public question if an instructional program is adequate or if testing is inadequate.

Using the charts and information in this guide, you should be able to select the most appropriate test for the behavior to be measured in a given situation.

RETENTION AND TRANSFER TEST DIFFERENCIES

RETENTION TEST	TRANSFER TEST
Requires student to demonstrate that he has retained knowledges and skills acquired during instruction. The same examples and situations experienced in instruction are included in the test. The student must remember what he has encountered during instruction.	Requires the student to demonstrate that he has retained knowledges and skills acquired during instruction and can apply them to new situations and examples not encountered during instruction. Different examples and situations are included in the test.

RELATING RETENTION AND TRANSFER TESTS TO TYPES OF BEHAVIOR

TYPE OF BEHAVIOR	TYPE OF TEST	
	RETENTION	TRANSFER
Associating	X	
Chaining (Motor or Verbal)	X	
Discriminating	X	
Performing Skilled Motor Acts	X	
Classifying		X
Rule Using		X
Problem Solving		X

If ALL resources are not available to develop and administer tests for ALL objectives, plan to develop tests only for:

(a) skill objectives and
(b) knowledge objectives involving:
    (1) Classifying,
    (2) Rule Using and,
    (3) Problem Solving

CONSIDERATIONS IN SELECTING THE BEST VOCATIONAL TEST

Paper and Pencil (Knowledge Tests)	Program Product or Performance Tests	Simulated Performance Test Situations	Actual Performance Test Situations
- Quick, easy to use, cheap, and available. - Yields an indicator of accomplishment. - Generally, measures a narrow range of knowledge or skill. - Generally, far removed from real life performance and not predictive of future success.	- Concrete projects or production accomplishments (e.g., break work, typing assignment, metal fabrication, demonstrations, and experiments, etc.) while in training are used to test knowledge and skill. - Simplier than arranging special situations for testing. - Less desirable than simulated performance testing: Typically, the student has had help and the test pressures are missing. - Requires more preparation, time, materials, and funds.	- Simulated performance testing in a contrived situation is common in vocational education. - Simulated performance test situations should be set up to resemble tasks the graduate will be required to do on the job or in post-secondary training. - Useful for evaluating transferable skills such as reasoning, attitudes, and psychomotor skills necessary for occupational success. - Easier to administer and score than actual performance tests. - Simulated test situations are not as expensive as actual performance test situations, take less time, and give quicker results to help prevent student and training program failures. - Simulated test situations, however, require more time and funds than paper and pencil tests, are not real, and the results may not match actual performance later.	- Generally, the actual performance situation is the ideal test. - The student can demonstrate minimum competency at a level identified as important to securing and keeping a skilled job. - Actual performance testing is commonplace in skilled occupations and has the decided advantage of realism. - Evaluating performance takes no time from teaching. - Performance testing is expensive, takes time, and the results may be available too late to help either the student or the vocational program correct failures.

(Cheaper, Least time, and least predictive) ←——→ (Most expensive, requires most time, but is most predictive)

CHOOSING A KNOWLEDGE TEST

MULTIPLE-CHOICE	MATCHING	COMPLETION	TRUE-FALSE	PRODUCTION
Best for selection among alternatatives such as proper tool or best procedure to do a job. Requires discrimination among several possible answers to select the correct one. Inappropriate where student must do something (i.e., make a repair). Best answer does not have to be the one and only indisputably correct answer; but, it must be defensible as the most nearly correct one from the alternatives presented. Include more alternatives than items to match or have the same alternatives match more than one item to reduce guessing. Watch alternatives that can be paired/rejected without knowledge of the subject. Can measure retention or transfer.	Appears appropriate for testing associations but is not a valid performance measure.	Appropriate for testing some associations, discriminations, and some portions of chains (e.g., fill in missing step) and more complex behavior knowledge. Most useful in testing a knowledge item in a specified context. Student may pass item from memory. Scoring is most objective when the answers is a specific word or phrase. Often misused by including too many completion blanks. Relevance to job performance is questionable.	Useful for testing specific fact or for testing simple discriminations. Encourages note memorization. If statements are out of context, it may be difficult to define the item as true or false. With only two possible answers (T or F), it is difficult to establish a meaningful criterion performance level. Relevance to job performance is questionable. Generally, avoid using true-false items in criterion tests.	Useful for listing/showing steps of a chain, or describing a particular discrimination, rule, or approach to solving a problem. Often multiple-choice and matching tests can be developed to test the same degree of training. Often scoring is not entirely objective. Requires special precautions to increase objectivity: Use a key, weigh item in advance, code tests to decrease bias, score papers one question at a time. Useful for testing for transfer.

PERFORMANCE TESTING

A performance test requires the student to demonstrate mastery of the desired behavior of the objective (accomplish a job-like task) under controlled conditions and according to predetermined standards.

The controlled conditions of the performance test allow the student to demonstrate the desired behavior and the conditions remain consistent from student to student.

1. Use the performance test when (a) it is important for the student to demonstrate the correct performance process or (b) produce the correct product.
2. In the performance test, the instructor must observe the student completing the process or the product correctly.
3. The performance test typically is a one-to-one situation. It requires the instructor's direct attention toward the student being tested and away from the remainder of the class.

Performance Process or Product Test

The student's vocational competency may be measured by a performance:

1. Process Test
2. Product Test

Process Test

The "process" test often is used when:

1. the sequence of performance steps is important
2. tools and equipment must be used correctly
3. performance time is important
4. health and safety hazards are present
5. evaluating the final product destroys the work

Basically, retention is being measured by the process test.

The typical "process" test might be a CHECKLIST.

Product Test

The "product" test typically is used to determine if the student can product the correct product.

Typically, the "product" test does not allow you to evaluate the process used to create the product. You may observe the product, but may not know if the correct or incorrect process was used.

Basically, it is a transfer test.

Most "product" tests use RATING scales.

Developing Performance Tests

The following steps may be followed to develop performance process and product tests:

1. State objective of test.
2. Select "process" or "product" test.
3. (a) If "PROCESS" test, list procedural steps. (CHECKLIST)

   NOTE: The steps of the process test should be independent. Each step should contain only one performance and should begin with a verb indicating the behavior expected of the student. All steps in the performance process should be listed.

   (b) If "PRODUCT" test, list points to be observed after performance is completed. (RATING)
   Determine if instructor checkpoints are needed.
4. Identify critical conditions in the performance.
5. Establish a criteria for scoring the satisfactory completion of each step or for rating the product.
6. Establish the acceptable mastery level score for the performance test.

Simulations

When it is not practical to create an actual job situation for performance training or testing, a simulation may be the best alternative.

In the simulation, you assume that a student who can demonstrate mastery of the objective in the simulation will be able to transfer the knowledge or skill to the actual job situation when required.

There may be several degrees of simulation to represent the actual situation: Mock ups, visual representations, verbal descriptions, or symbols.

CHARACTERISTICS OF A GOOD TEST

The outcome-referenced measurement should be valid, reliable, objective, comprehensive, and economical.

Valid

If the measure requires the same behavior that are identified in the objectives, then the scores are considered valid.

According to Clark (Using Instructional Objectives in Teaching, p. 69), "An objective asks the student to demonstrate some behavior relative to some content; a measuring instrument also asks the student to demonstrate some behavior relative to some content. The degree to which the two behaviors and the two topics correspond will be the degree to which the instrument is valid. This type of validity is called content validity."

Content validity, generally, is accepted as the most important characteristic of a measuring instrument. If the measuring instrument does not measure what it was designed to measure, it does not have meaningfulness.

The starting place in order to ensure that a test has validity is to be sure the objectives of the course are defined clearly.

Reliability

If the test is consistent in its measurement, it is considered reliable. Every time it is used, it should measure exactly the same way.

If the objective calls for a specific type of behavior and the test calls for the same behavior, the test should have high reliability.

Objectivity

Regardless of the test scorer, the results should be about the same. Test results should reflect as little judgment of the test scorer as possible.

"All else being equal, an objectively scored test is more reliable than a subjectively scored one." (Instructional Systems Development for Vocational and Technical Training, p. 5)

Comprehensiveness

If a test item is employed for every objective, the outcome-referenced measure will represent a comprehensive coverage of the desired behaviors.

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Economy

The measurement instrument should be practical and economical regarding manpower, facilities, and support services. The outcome-referenced measure appears to outperform the typical paper-and-pencil test in these regards and especially when test construction provides for the possibility of a gain in reliability and validity.

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PART V

WRITING/CRITIQUING TEST ITEMS
MATCHING MEASUREMENT WITH OBJECTIVES

TASK OF TASK FORCE COMMITTEE

To determine if the test item is suitable for assessing achievement of the objective, the task force committee should apply the following criteria.

RULE

The following rule applies to developing tests for performance-based instruction.

RULE: Match the performance, conditions, and standards of the tests with those of the objectives.

(SUGGESTION) Review the objective and suggested instruction time on the performance objective page description of each task to decide on how much weight should be given to each task or test item.

NOTE: The instruction time allotted to a task should indicate how important or complex the task is and should indicate the number of test items that might be used.

STEPS TO VALIDATE TEST ITEMS AGAINST OBJECTIVES

1. Analyze objective into parts

2. Analyze test item into parts

3. The parts are either the same or different

1.	2.	3.
The objective should tell what the student is expected to do and how the instructor will know when the student is able to do it.	If a statement is not an objective, the instructor will not be able to select test items that match.	Test items must match the objective in performance, conditions, and standards.

(Adopted from: Mager, Robert F., Measuring Instructional Intent, Belmont, CA: Fearson Pitman Publishers, Inc., 1973)

MAIN INTENT OF THE OBJECTIVE

The performance behavior in an objective may be stated clearly or it may be implied. The main intent of the objective must be evident if it is a valid objective!

Main Intent:	The performance which is the purpose of the objective.		
	(Example)	Given ten envelopes, a list of addresses, and a set of standards, be able to type addresses on the envelopes...	Main intent is to (type)
Indicator:	An indicator (implied) behavior tells what is the main intent of the objective.		
	(Example)	Be able to select correctly types envelopes from a stack of...	Indicator of performance... (main intent is to be able to recognize correctly typed envelopes)

To measure the accomplishment of an objective, it is essential to be able to identify the intent of the objective.

A simple, direct indicator behavior, well within the knowledge of the student, is preferred in an objective.

The main intent of the objective may be a visible performance such as the manipulation of tools which can be identified easily or it may be a performance that is non-observable such as a cognitive (mental) process (an internal behavior).

COVERT MAIN INTENT

When the main intent of the objective is a covert (non-observable) performance (a mental process), an indicator behavior must be added to help identify the main intent of the objective.

WHEN YOU HAVE	(A non-observable performance as the main intent of an objective.)
ADD	(An indicator behavior.)

Directly visible or audible (overt) behaviors:

- write
- list
- recite
- draw
- weld
- adjust
- type
- solder
- file

Non-observable (covert) behaviors:

- identify
- solve
- recognize
- recall
- add
- calculate

Example of non-observable behavior & indicator statement:

(Objective)	(Test Item)
"Given any file folder from the Accounting Exercise, be able to return the file to its correct place in the file cabinet." (The student is being asked to file.)	"There are ten correctly labeled folders in this envelope. File them in their proper alphabetic or numberic file."

TYPE OF PERFORMANCE OFTEN INDICATES BEST TEST

In writing objectives, each task should have been identified with a principal type of performance. The type of performance will help indicate the type of test item needed.

SEE: Workshop Guide II, Writing Objectives, Actions, and Standards (Types of Performance)

Types of Performance	(As a Start, test for...)
Discrimination	(retention)
Problem-solving	(transfer)
Recall	(retention and steps (sequence)
Manipulation	(performance)
Speech	---

VERB USED MAY INDICATE BEST TEST

The "VERB" used in the performance objective generally will indicate the best type of knowledge test item to be developed.

1. Consider essay or completion questions when the behavior is to:
    - Describe
    - Define
    - Explain
    - Cite
    - State
    - List
2. Consider multiple-choice or matching questions when the behavior is to:
    - Select
    - Identify
    - Indicate
    - Differentiate
    - Choose
    - Match

SEE: Following page, "Selecting an Appropriate Verb for the Performance Objective"

The verb of the objective often will indicate the complexity of performance behavior (and typically if a retention or transfer test should be used).

Types of Behaviors: (See previous section concerning retention/transfer tests.)

Simpler
- Association
- Motor Chaining (sequence of motions)
- Verbal Chaining (sequence of words, numbers)
- Discrimination (identify two or more items)

Complex
- Classifying: Objects, people, or events
- Rule Using
- Problem Solving

Typically, complex behaviors require *more practice* than simple behaviors.

SELECTING AN APPROPRIATE VERB FOR THE PERFORMANCE OBJECTIVE

Using action verbs reduces ambiguity. Unless you specify student behavior with an action verb, the student will probably end up doing something else.

ACTION VERBS VARYING QUANTITY			
CRITERIA FOR VERBS	POOR VERBS	BETTER VERBS	BEST VERBS
observable	appreciate	compute	adjust
measurable	learn	construct	checkoff
verifiable	know	indicate	label
reliable	understand	operate	turn

Simple Behavior

Complex Behavior

Concept Behavior (requires more practice than simple behavior)

ASSOCIATING	MOTOR CHAINING (Sequence of Motions)	VERBAL CHAINING (Sequence of Words or Numbers)	DISCRIMINATING (Identify Two or More Inputs)	CLASSIFYING OBJECTS, PEOPLE, OR EVENTS	RULE USING	PROBLEM SOLVING
identify	adjust	arrange	choose	arrange	calculate	adapt
specify	aline	cite	compare	categorize	calibrate	adjust to
indicate	close	enumerate	contract	classify	check	analyze
match	disassemble	isolate	couple	collect	compute	build
mate	disconnect	itemize	decide	compile	convert	compose
label	duplicate	list (in order)	detect	file	coordinate	construct
	insert	quote	differentiate	grade	correct	create
	lift	reproduce	discern	group	define	design
	locate	state, restate	discriminate	inventory	demonstrate	develop
	measure	transcribe	distinguish	isolate	describe	diagnose
	open	type, write	divide	mate	determine	draw
	operate	tabulate	isolate	rank	diagram	find a way...
	pull, push		judge	rate	estimate	figure
	remove		pick	sort	evaluate	formulate
	replace		recognize		examine	invent
	rotate		select		explain	make
	show procedures				figure	reason
	tighten				generalize	resolve
	tune				illustrate	study
	turn on/off				interpolate	think through
	twist				interpret	transcribe
					monitor	troubleshoot
					plan	
					prescribe	
					project	
					schedule	

MATCH THE CONDITIONS

The conditions in both the objective and test item must be the same for the instructor to measure if the objective has been achieved.

The objective has been written because you, the instructor, considered it important. By testing to determine if the objective has been achieved, you can measure how effective the instructional program has been.

Avoid writing test items that ask for "performance under more or less stringent conditions" than stated in the objective.

Avoid writing test items that impose different standards than called for in the objective.

TO BEGIN WRITING TESTS

Test items should be constructed solely from the objectives of the training program. The statement of the objectives should indicate the level of knowledge or skill to be tested.

One way to start writing test is to take each objective and divide the statement into (1) the behavior requested (generally the complete verb) and (2) the topic of the objective (generally the direct object and modifiers). From this information, develop as many tests as required to establish the student's competency to meet the objective.

The sequence of the test items should follow the sequence of the tasks (representing the order in which the performance typically occur on the job).

TEST CONSTRUCTION HINTS

"Good tests do not happen simply as a product of last-minute inspiration". States Devona (*Test Construction for Training Evaluation*). "It takes patience to construct good test and it is time-consuming."

The following suggestions will help you develop valid test items:

1. List all key points covered in the training activities.
2. Determine, with respect to each key point, what is required:
   a. Recall
   b. Recognition
   c. Problem-solving
   d. Skill (manipulative)
3. Increasing the number of test items tends to increase reliability.
4. Include several types of items on the test.
5. True-false items reduce test reliability.
6. When it is necessary to grade trainees, using a formula that corrects for guessing is not recommended.
7. Keep weighting of items to a minimum. If a point is highly important, include several test items on that point.
8. Include complete directions for each type of test item. Include an example showing how each type of item is to be answered.
9. Word each item in the simplest possible manner.
10. Do not "lift" statements directly from books.
11. Underline key words, but don't overdo it.
12. Avoid "curve-ball" test items, catch questions, or "trick" questions.
13. Do not include one item that supplies the answer to another.
14. Do not include any item for which the answer is obvious to a person who does not know the subject matter.
15. There should be only one correct and undisputed answer.
16. The choice of answers should deal with similar rather than unrelated ideas.
17. The questions should require the trainee to use knowledge gained rather than to demonstrate memory for small detailed facts.
18. Avoid questions that can be answered solely on the basis of general knowledge not included in the classroom activities.
19. Avoid asking questions on trival details.
20. Ingenuity in construction of items adds to their interest and diagrams, pictures, and graphs help clarify the test items.
21. Keep the language and punctuation clear.
22. State each item in the working language of the trainee.
23. Use plausible choices.
24. Scatter the position of the correct answer. Avoid setting a pattern.
25. Each item should test only one idea.

PART VI

ILLUSTRATIONS: MEASURING COMPETENCY

Part VI illustrates how students may be evaluated using a validated competency-based approach to determine student proficiency in vocational knowledges and skills (and attitudes).

The minimum standards for the test items should be determined by the requirements for successful entry into the next higher level of education or for successful entry level employment.

ILLUSTRATIONS

The enclosed sample instruments and aids are included to assist instructor task force committee participants in the process of writing/developing/critiquing outcome-referenced tests for performance-based instruction.

A. "Instructions for Answering Outcome-referenced Test Items"

   This enclosure illustrates how one set of test instructions may be used repeatly for testing. The illustration shows also how test items may be worded and how answers may be indicated.

B. The sample test items from "Electrical and Ignition Systems" in the Articulated, Performance-based Instruction Guide for Automotive Mechanics illustrates how a paper and pencil test may be designed to measure performance.

C. Sample "Performance Checklist" process test. (Basically measuring retention.)

D. Sample "Rating Scale" product test (Basically measuring transfer.)

E. Sample "procedures" checklist.

F. Sample "product" evaluation/checklist.

G. Sample attitudinal checklists/rating methods.

H. Sample unit/module summary checklist.

I. Instructor's "Proficiency Evaluation Aid"

J. "Proficiency Report" of Vocational training

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Sample A

INSTRUCTIONS FOR ANSWERING OUTCOME-REFERENCED TEST ITEMS

Typically, eleven (11) different types of outcome-referenced test items may be used in the competency test.

1. True-False
2. Completion (Fill-in Blanks)
3. A Combination of True-False and Completion
4. Multiple-Choice
5. Matching
6. Identification
7. Short Answer
8. Long Answer
9. Program Product of Performance Test
10. Simulated Performance Test
11. Actual Performance Test

An example of each type of test item is included. Carefully study the illustration test item and the directions for answering the question. These directions will not be given again. Your test questions may vary slightly in the format, however, the instruction should be applicable. Where necessary, the instructor will supplement these instructions.

Do not guess. Guessing does not add to your knowledge, even if you happen to guess right. If you do not know the answer skip the test item and go to the next question. Remember: Enter your answers in the blanks provided on the separate answer sheet, if used.

---

1. TRUE-FALSE

Directions: Read the statement carefully. Decide whether it is true or false. Answer by marking T or F in the blank provided to the right (or, if answer sheet requires, mark "X" in the appropriate (T) or (F) parenthesis, or "circle" T or F).

Example: Lumber shrinks across the grain of the board. (T) (F)

2. COMPLETION (Fill-in Blanks)

Directions: Complete the statement by printing on the blank line the word or words which make a complete and correct statement.

Example: Proper edge spacing will restrict __?__ and ensure good weld penetration. distortion

3. COMBINATION OF TRUE-FALSE/COMPLETION

Directions: If the statement is correct, in the parenthesis mark (T) or answer true, as required. If the statement is incorrect, mark (F) in the parenthesis and fill in the blank provided with the appropriate word or term which, if substituted for the underlined word, would make the statement correct.

Example: A pantry chef usually is the head chef's first assistant. (T) (F)

sous

4. MULTIPLE-CHOICE

a. Directions: You are given three or four choices from which to make a complete and correct statement. In the blank answer space provided, write in the "letter" indicate the best choice.

Example: The head chef's first assistant is a ? .

a. junior chef

b. sous chef

c. pantry cook

b

b. Negative Answer Multiple-Choice

Directions: If the multiple-choice question includes the word EXCEPT, you should look for the choice that does not fit the question. Read the entire question carefully before you choose your answer.

Example: All of these could cause high starter current draw EXCEPT:

a. work starter bushing

b. bad starter relay

c. grounded field coils

d. grounded armature

b

5. MATCHING:

Directions: For each given item in the left hand column, match it with the appropriate item from the right hand column. Write the letters of the correct or best answer in the appropriate blanks.

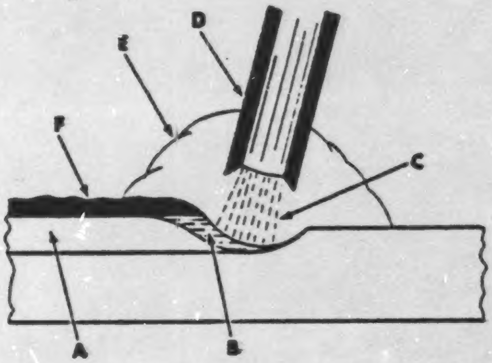
Example: Match these metric terms on the left with their proper equivalents.

b deca a. thousands
e meter b. tens
a kilo c. units of length measurement

6. IDENTIFICATION

Directions: Identify each labeled part of the illustration below and write the name next to the appropriate letter in the blank provided.

Example:



a. base metal
b. molten metal
c. arc
d. electrode
e. gas shield
f. slag

7. SHORT ANSWER

Directions: Write the correct answer in the blank provided.

Example: What type of electrode is best for vertical and overhead welding? fast-freeze

8. LONG ANSWER

Directions: Using as few words as possible, write the answer to the question in the blank provided.

Example: What should be done if the electrode welds fast to the work?

"Electrode should be broken loose by twisting or bending the holder."

9. PROGRAM PRODUCT OR PERFORMANCE TEST

Definition: Concrete project or production accomplishments during training are used to test knowledge or skill. Typically, test pressures are missing and the student may have had help in completing the task.

Directions: Instructor will observe student during training and by checklist or rating scale will rate student's performance or knowledge.

Example: Given an oven for baking, food items, and necessary implements and equipment; load the oven with foods to be baked. All items on a checklist used to rate performance must receive an acceptable rating. The task must be accomplished within 15 minutes.

CHECKLIST

(Load Oven Racks)

ACTIVITY	RATING	
	Acceptable	Unacceptable
1. Gathered needed supplies.		
2. Used needed supplies.		
3. Pulled oven rack partially out while loading.		
4. Stacked oven shelves 8 inches apart for baking.		
5. Placed food on rack so that heat circulated adequately.		
6. Followed appropriate safety precautions.		

10. SIMULATED PERFORMANCE

Definition:	Contrived situation, resembling tasks the graduate will be required to do on the job. This form of test is useful for evaluating transferable skills such as reasoning, attitudes, and psychomotor skills necessary for occupational success.

11. ACTUAL PERFORMANCE TEST

Definition:	Exhibits the advantage of realism, but may be too late to help either the student or the vocational program correct failures.
Example:	Given an automobile with a leaking pinion seal, access to proper tools and equipment, replacement parts, and service manual; replace the pinion seal according to manufacturer's recommended procedures. The job should be completed within 2 hours. The manufacturer's specifications must be met and the completed job must meet the instructor's standards.

UNIT 7.0 - ELECTRICAL AND IGNITION SYSTEMS

OUTCOME-REFERENCED TESTS

TASK 7.29-a

You are making a resistance check on a General Motors HEI system. Look at Figure 1.

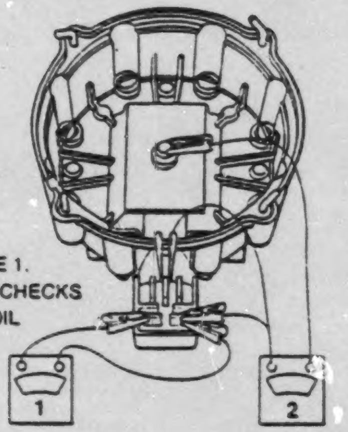


FIGURE 1.
OHMMETER CHECKS
OF COIL

1. Ohmmeter set up (1) reads .5 ohms. According to this reading, you should:

___ a. replace the coil
b. go to the next step, since the reading is correct
c. neither of the above
d. check your ohmmeter range setting

2. Ohmmeter set up (2) reads 20,000 ohms. According to this reading, you should:

___ a. remove coil from cap and check again
b. go to the next testing step, the reading is within an acceptable range.
c. replace the coil
d. switch ohmmeter range setting to lower range an read the scale

3. In the ohmmeter set up (2) of Figure 1., assume that the resistance reading (ohms) indicates a problem. Answer the following true-false question:

___ A bad center button or broken spring can cause an incorrect reading.

Unit 7.0 - Electrical and Ignition Systems (Con't.)

Task 7.29-b

You are continuing to make resistance checks on a G.M. HEI system. Look at Figure 2. below.

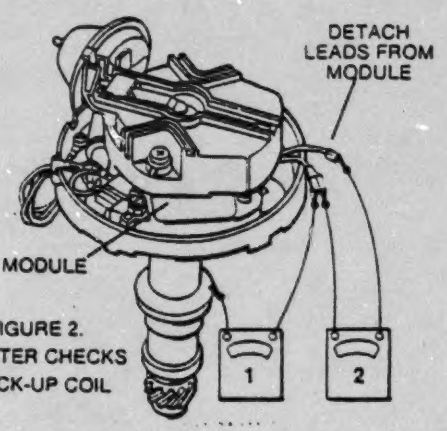


FIGURE 2.
OHMMETER CHECKS
OF PICK-UP COIL

1. You are reading the ohmmeter set up (1). Throughout the vacuum range, the ohmmeter reads infinity at all times:

___ a. you have the meter leads shorted
b. the meter leads are open somewhere
c. the resistance is incorrect, replace pick-up coil
d. resistance is correct, proceed with next step in check

2. You now are observing the ohmmeter reading in set up (2). Throughout the vacuum range, the ohmmeter reads +/- 1000 ohms at all times. Assume all preparations are correct for the test:

___ a. a reading of 500-1500 ohms is typical
b. replace the pick-up coil, the resistance is incorrect
c. a malfunction exists, the resistance should vary with throughout the vacuum range
d. replace the module, the reading should be infinity.

Sample C

MIG WELDING EQUIPMENT CHECKLIST

CHECK

1. All power controls are off. ( )
2. Cable and hose connections are secure. ( )
3. There are no visible breaks in the cable insulation. ( )
4. The gun has the right nozzle for the diameter wire. ( )
5. Wire is threaded correctly through the gun. ( )
6. Nozzle is clean and free of obstructions. ( )
7. Wire feed is set. ( )
8. Shielded gas flow is set. ( )
9. Water is turned on if a W.C. gun is used. ( )
10. Wire stick-out is correct. ( )
11. Contact tip of gun is in good shape. ( )
12. Voltage control is set correctly. ( )
13. Adequate ventilation is provided for welding. ( )
14. Gloves and helmet are available. ( )
15. Clothing for welding is suitable. ( )

Source: Giachino, Joseph W. Arc Welding, Alsip, IL: American Technical Publishers, Inc., 1977.

NOTE: This rating form may be used during the entire two years of food service training, especially for food preparation.

RATING GUIDE
FOR
FOOD PREPARATION LABORATORY

DIRECTIONS: Rate each activity either an 0, 1, or 2, based on the description given. Record the score on each item in the right hand column. Add (total) the scores to determine the total score.

Activities	0	1	2	Score (0, 1, 2)
Follows verbal instructions	Talks while directions are being given. Does not listen, does not follow orders.		Listens carefully to directions and follows them. Sometimes takes notes.	____
Planning	Does not make work plan and schedule.		Makes work plan and schedule.	____
Follows written directions	Does not understand or follow directions in given order as given or does not use recipe.		Understands and follows directions as given. Asks questions in case of doubt. Uses recipes when available	____
Work habits	Has no organization. Careless, spills measured ingredients, forgets what has or has not been added. Does not clean up when finished.		Has work well organized. Careful, precise in measurement; if spilled, remeasures; thorough and accurate. Cleans well when work is completed.	____
Use of equipment	Does not select proper equipment for tasks. Does not make use of time and labor saving appliances.		Uses proper equipment for tasks. Uses all available appliances such as mixers, disposals, dishwashers. Asks questions about unfamiliar equipment.	____

D-1

Sample D

Activities	0	1	2	Score (0, 1, 2)
Group working habits	Does not work together well. Lacks cooperation. Argumentive.		Works well together. Divides work equally.	____
Need for help	Asks unnecessary questions continuously. Must be told every step.		Works alone. Asks few questions. Knows what to do ahead of time.	____
Control in an emergency	Gets excited when things go wrong. Needs help to take care of situation.		Is level-headed in an emergency. Repairs damage easily.	____
Safety and sanitation	Is careless in personal habits. Does not follow safety procedures.		Follows both safety and sanitation procedures.	____
Product	Does not meet acceptable standard. Taste not acceptable.		Meets standard for an acceptable or superior product. Tasty.	____
Service of food	Does not serve food attractively. Is not served at proper time or temperature. Does not set table properly.		Serves food attractively. Serves food at proper time and temperature. Set table properly.	____
Clean up	Does not wash dishes and utensils. Supplies and equipment not returned to proper place. Floors and counters not cleaned. Area not inspected.		Washes dishes and utensils. Supplies and equipment returned to proper place. Cleans floors and counters. Inspects area.	____

TOTAL SCORE [____]

Maximum = 24
90% = 22
80% = 19
70% = 17
60% = 14

Comments on food products: ____________________

General comments: ____________________

Learner(s): ____________________

Sample E

SAMPLE
INSTRUCTOR'S CHECKLIST
OVERHAUL AUTOMATIC TRANSMISSION

Procedures

U S

( ) ( ) 1. Cleaned entire outside of the transmission prior to disassembly with a steam cleaner.

( ) All openings plugged to prevent the entrance of water into the transmission.

( ) ( ) 2. Removed torque converter by simply pulling it off the stator reaction shaft.

( ) Converter placed in a pan upside down to drain. The fluid that circulates through the transmission also circulates through the torque converter.
( ) If there is any evidence of contaminated fluid either in the transmission or in the drained fluid from the converter, the converter flushed.

( ) ( ) 3. Prior to disassembly, checked transmission for gear train end-play.

( ) End-play is measured with a dial indicator. Checked planet gears for too much play. ( ) Play is corrected by one or more selective thrust washers inside the transmission.

( ) ( ) 4. Turned transmission upside down and removed the pan. Screen and valve body detached by removing their hold down bolts.

( ) Observed and noted check balls under the valve body if transmission equipped. Saved any gaskets found between the valve body halves or case to matched up with the new gaskets.

( ) ( ) 5. Removed the front pump housing.

( ) Identified if front pumps must be removed with a slide hammer or hammers by locating two threaded holes in the pump housing to connect the slide hammers.

( ) ( ) 6. With the front pump housing removed, the front clutches and planetary components removed by pulling them through the front opening in the case. ( ) The rear planetary units are taken out from the front, after the removal of snap rings on the output shaft. ( ) Extension housing removed to allow access to the governor distributor sleeve and output shaft.

( ) ( ) 7. The clutch pack assemblies disassembled, using a clutch compressing tool. First, the outside snap ring removed. The clutch piston retained by a second snap ring.

SAFETY CAUTION: This map ring is under spring pressure and should be removed only with a compressing tool.

( ) As tool removes the spring pressure by pressing on the piston, snap ring is removed. ( ) As tool is released, retainer and springs may be removed. ( ) Piston may be removed by taping the unit on a piece of wood or by applying compressed air behind the piston.

SAFETY CAUTION: ( ) Safety glasses must be worn when using an air hose.

( ) ( ) 8. All the metallic components of the transmission cleaned in a solvent tank (as necessary). The valve in the valve body may or may not be removed for cleaning, depending upon how much contamination is evident in the transmission. ( ) If the valve body disassembled, it is handled carefully so that springs and valves are not mixed up.

( ) ( ) 9. After cleaning the transmission, parts inspected carefully for abnormal wear. Replacement parts normally will be provided in an overhaul set, including all servo and clutch seals, as well as all necessary gaskets. If the transmission has very high mileage or extensive wear, the clutch discs or shaft bushings may need replacement.

U S

( ) ( ) 10. ( ) A new seal is installed on each of the clutch pistons. ( ) The new seal stretched around the piston. ( ) Seal installed in the correct direction. Piston and seal lubricated with transmission fluid and pushed into the clutch cylinder. ( ) Return spring(s) and retainer placed into position. ( ) Assembly must compressed with the clutch tool and the snap ring installed. ( ) Steel and friction discs may then be installed in the cylinder. (Steel discs installed at either end of the clutch pack may be thicker than those in the middle.)

( ) Tied the parts together on disassembly to aid in reassembly.

( ) ( ) 11. New seal is installed on each of the servo pistons.

If servo use a bonded seal requiring a new piston and seal to be replaced as a unit, piston and seal are lubricated with transmission fluid and installed in the piston bore.

( ) ( ) 12. Output shaft, governor assembly, and extension housing are replaced on the rear of the case. ( ) Planetary components may then be installed through the front case opening. ( ) Clutch packs are installed and the front pump bolted in place.

( ) Front pump bolts torqued. ( ) After reassembly, rechecked the end-play with a dial indicator.

( ) ( ) 13. ( ) Replaced all the check balls in the case passages. ( ) Used the correct gaskets to mount the valve body in place on the case. ( ) Installed filter screen. ( ) Adjust the band or bands to the proper specifications. ( ) Checked that all the linkage inside the transmission properly connected.

( ) ( ) 14. Replaced the pan and pan gasket.

( ) ( ) 15. ( ) Following the overhaul instructions, assembled the transmission. ( ) Adjusted and checked tolerances ad directed. ( ) Checked to be sure that binding does not exist in the power train or torque converter. ( ) Installed new gaskets and seals.

( ) ( ) 16. If applicable, bench-checked oil pressures according to the manufacturer's specifications.

( ) ( ) 17. Installed transmission assembly in the car and attach the shifting controls.

( ) ( ) 18. Adjusted the shifting controls.

Payed specific attention linkage connected to the carburetor, if equipped.

( ) ( ) 19. Filled the transmission according to the manufacturer's instructions.

( ) ( ) 20. Tested oil pressures and band adjustments according to the manufacturer's instructions.

(All items applicable must be checked satisfactory.)

U = Unsatisfactory

S = Satisfactory

Sample F

EVALUATION OF BREAD PREPARATION

DIRECTIONS: (1) On the line below write the name of the product to be evaluated.

BREAD PRODUCT: ____________________

(2) In the squares provided below each characteristic write in the evaluation of the asked product.

CHARACTERISTICS

Outside Appearance	Inside Texture	Texture

(3) Check the reason for the product turning out this way to the left of the proper criteria below the squares.

REASONS

- ___ Recommended mixing
- ___ Over mixing
- ___ Under mixing
- ___ Shortening NOT cut in
- ___ Shortening cut in
- ___ Proper amount of ingredients
- ___ Too much of one or more ingredients
- ___ Too little of one or more ingredients
- ___ Proper treatment of pans
- ___ Improper treatment of pans
- ___ Cooked at proper temperature
- ___ Cooked too long
- ___ Cooked too little
- ___ Cooked at proper time after mixing
- ___ Cooked at improper time after mixing
- ___ Handled properly
- ___ Handled too little
- ___ Handled too much

Enter number of correct procedures performed. ☐

Enter the number of wrong procedures performed. ☐

Evaluation: If the number of correct things performed equal 6-7, an outstanding Breadsman results; 4-5, the Baker needs a little more practice; 2-3, the Doughman needs a lot more practice; and 0-1, the Mixer needs to start all over and follow the directions precisely again.

Student Baker: ____________________

CHECKLIST

MAKING BISCUITS

	RATING	
	Acceptable	Unacceptable
1. (a) Rolled biscuits were uniform in shape with straight sides and level tops... OR (b) Dropped biscuits were well rounded with a rough surface and crisp crust.		
2. Biscuits were uniform in size and twice the size of an unbaked one.		
3. Biscuits had uniform, golden brown tops and bottoms and were free from brown or yellow spots.		
4. Biscuits had a tender crust which was moderately smooth and free from excess flour.		
5. Inside of biscuits were flaky, pulling off in thin sheets, with medium fine, even cells.		
6. Biscuits had a pleasing, well-blended flavor.		
7. Biscuits were tender, slightly moist and light in texture.		
8. Interior of the biscuits was creamy white, free from yellow or brown spots.		

Sample G

WORK ATTITUDE SCORE CARD

DIRECTIONS: Score the learner on the following attitudes and work behavior by circling the appropriate description either "yes" (+) or "no" (-). Indicate any comments to support the rating or recommendations.

	Circle		Comments/ Recommendations
	(No)	(Yes)	
Cooperative	-	+	
Courteous	-	+	
Loyal	-	+	
Tackful	-	+	
Self Disciplined	-	+	
Respectful	-	+	
Alert	-	+	
Motivated	-	+	
Responsible	-	+	
Trustworthy	-	+	
Dependable	-	+	
Cheerful	-	+	
Polite	-	+	
Interest	-	+	
Friendly	-	+	
Sympathetic	-	+	
Accepts changes	-	+	
Follows rules and regulations	-	+	
Does share of work	-	+	
Helps others, if needed	-	+	
Works regularly	-	+	
On time	-	+	
Shows pride in work	-	+	
Keeps promises	-	+	
Does not waste time	-	+	
Controls anger	-	+	
Accepts criticism	-	+	
Follows superior's directions	-	+	

28 Items total TOTAL (+'s) ____________

Interpretation

28 = 100% = Level 4 Competency Rating (See competency reporting scale)
25 = 90% = Level 3 Competency Rating
22 = 80% = Level 2 Competency Rating
20 = 70% = Level 1 Competency Rating
17 = 60% = Level 0 Competency Rating

Student: ______________________________________

JOB PERFORMANCE RATING SHEET

Student ______________________ Job Performed ______________

Dates from ______________________ to ______________________

Place of work ________________ Supervisor _________________

DIRECTIONS: Circle the number that best fits your opinion of the student's performance using the following factors:

	Never	Seldom	Frequently	Usually	Always
1. Gets to work on time	0	1	2	3	4
2. Uses time properly	0	1	2	3	4
3. Shows interest in work	0	1	2	3	4
4. Shows dependability	0	1	2	3	4
5. Is ambitious	0	1	2	3	4
6. Is neat (work and self)	0	1	2	3	4
7. Works well with others	0	1	2	3	4
8. Follows directions	0	1	2	3	4
9. Works without supervision	0	1	2	3	4
10. Shows good manners	0	1	2	3	4
11. Meets people well	0	1	2	3	4
12. Uses knowledge on the job	0	1	2	3	4
13. Seeks assistance, when necessary	0	1	2	3	4

Does the worker have the skills for doing satisfactory work? Yes __ No __

List the skills or characteristics that need to be developed or improved upon:

____

____

____

____

Additional comments:

____

____

____

Date ______________________ Supervisor ______________________

Sample H

CHECKLIST FOR SMAW WELDS

CHECK TO INDICATE THAT THE STUDENT HAS COMPLETED THE WELD TO INDUSTRY STANDARDS (Omit otherwise)

	Flat					Horizontal					Vertical					Overhead					Pipe		
	Stringer	Butt	T	Lap	Corner	Stringer	Butt	T	Lap	Corner	Stringer	Butt	T	Lap	Corner	Stringer	Butt	T	Lap	Corner	Flat	Vertical	Diagonal
1. Even bead.																							
2. Even ripples in bead.																							
3. Bead uniform in width.																							
4. Bead height not excessive.																							
5. No holes in weld.																							
6. Weld not brittle.																							
7. No excessive metal under joint.																							
8. Proper penetration.																							
9. No cracks.																							
10. End crater filled.																							
11. No cold overlaps along joint seam.																							
12. Good fusion.																							
13. No undercutting.																							
14. No porosity.																							

WELDING

PROFICIENCY EVALUATION AID

This descriptive aid is designed to possibly assist the welding instructor in standardizing the proficiency evaluation of students.

PROFICIENCY	LEVEL 0	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
Description	No skill level demonstrated or proficiency training not given in the skill.	Individual's skill level is not that generally expected for entry-level employee.	Individual's skill level probably is that expected for entry-level employment, but the individual probably will need close on-the-job supervision for a while longer.	Individual's skill level is that generally expected for entry-level employment.	Individual's skill level is equal to that of a worker with some on-the-job experience.
		PLANNING PROJECTS			
Procedure		Did not work from a plan.	Some steps wrong or missing.	A few minor changes needed.	Plan completed; no changes needed.
Working drawing or sketch	"	Incorrectly drawn, poor dimensioning.	Able to use with some changes.	Minor needed dimensions omitted.	Able to use; no changes needed.
Fabrication and usefulness of project ability	"	Not usable for intended purpose.	Able to use with some changes.	No changes made; could be improved.	Well fabricated for purpose intended.
Problem-solving ability	"	Solved no problems.	Solved only easy problems.	Solved nearly all problems.	Solved all problems.
		FABRICATED-WELDED PROJECTS			
Appearance, Welds, Joints	"	Assembled poorly; not finished.	Not very neatly assembled.	A few final touches needed.	Clean, neat, and commercial in appearance.
Method of fabrication	"	Used own method; "cut and try".	Made poor use of methods shown.	Followed correct methods most of the time.	Use the demonstrated methods.
Tools	"	Careless with tools, equipment.	Used tools and equipment correctly most of the time.	Correctly used tools and equipment at all times.	Correctly used and cared for tools, etc., at all times.
Materials	"	Wasteful and careless with materials.	Wasteful with materials at times.	Usually careful of materials.	Conserves materials at all times.
Accuracy of work.		Failed to meet specifications.	Work is approximately correct.	A few measurements are off.	Meets all specifications.
Working time.	"	Little or no effort made to use time wisely.	Time used fairly well.	Wasted small amount of time.	Used time to best advantage.

Sample J

Name ______________________________ Year ____________________

Section ____________________ Instructor ____________________

PROFICIENTY REPORT

AUTOMOTIVE MECHANICS

			Proficiency Level 0	Level 1	Level 2	Level 3	Level 4	Date Completed	Instructor's Initials	Student's Initials
UNIT 1.0		INTRODUCTION TO AUTOMOTIVE MECHANICS								
	1.0 B	Demonstrated an understanding and working knowledge of safe practices in the shop. ( ) written test ( ) shop work								
	1.0 F	Demonstrated proper selection, use, and maintenance of various hand tools used in shop. ( ) written test ( ) shop work								
	1.0 F	Demonstrated proper selection, use, and maintenance of various power tools used in the auto shop. ( ) written test ( ) shop work								
	1.0 H	Used shop manuals and technical publication handbooks, wiring diagrams, diagnosis manuals, Motors, Chilton and Glenn service manuals. ( ) written test ( ) shop work								
	1.0 E	Used math skills for calculations involved in automotive service work. ( ) written test ( ) shop work								
	1.0 E	Demonstrated ability to follow job procedures and completed job forms and records. ( ) written test ( ) shop work								
	1.0 E	Identified ten different local service jobs and the training needed.								
	1.0 I	ENGINE SYSTEMS/SERVICE								
		Performed cylinder leakage test.								
		Performed cylinder compression test.								
		Performed power balance test.								
		Performed valve cleaning and inspection.								
		Performed valve facing and rocker arm service.								
		Performed valve seating and assembly.								
		Performed valve guide wear checking methods.								
		R/R cylinder heads.								
		Adjusted valves.								
		Installed valve cover gaskets.								
UNIT 2.0		LUBRICATION SYSTEMS/SERVICE								
		Performed lubrication service and minor safety check.								
		Changed engine oil and/or filter.								
		Lubricated front suspension and steering leakage.								
		Adjusted and repaired front wheel bearings.								
UNIT 3.0		ENGINE MAINTENANCE, REPAIR, AND OVERHAUL								
		Diagnosed needed engine repairs using vacuum tests.								
		Dis/assembled and serviced major engine components.								
		R/R engine components.								
		R/R engine.								
		Diagnosed engine component malfunctions.								
UNIT 4.0		FUEL SYSTEMS/SERVICE								
		Adjusted carburetor and cleaned externally.								
		Cleaned or replaced fuel filter.								
		Inspected, serviced, or replaced carburetor air cleaner.								
		Rebuild carburetor: 1 venturi								
		2 ventori								
		4 venturi								
UNIT 5.0		EMISSION CONTROL SYSTEMS/SERVICE								
		Inspected exhaust components.								
		R/R individual exhaust components.								
		Demonstrated ability to safely use torch for heating and cutting.								

		Proficiency Level 0	Level 1	Level 2	Level 3	Level 4	Date Completed	Instructor's Initials	Student's Initials
UNIT 6.0 A	COOLING SYSTEMS/SERVICE								
	Inspected, adjusted, or replaced fan belts.								
	Checked coolant freezing point.								
	Pressure tested cooling system.								
	Replaced heater hoses.								
	Replaced radiator hoses.								
	Chemically cleaned and flushed cooling system.								
	R/R thermostat.								
	Inspected water pump for mechanical malfunction.								
	R/R water pump.								
UNIT 6.0 B	HEATER SERVICE								
	Diagnose heating system malfunctions.								
	R/R water heater hoses.								
	R/R water heater core.								
UNIT 6.0 C	A/C SERVICE								
	Pressure test and leak test AC system.								
	Inspect/recharge A/C system with refrigerant.								
	Check A/C system for satisfactory operation.								
	R/R A/C components.								
UNIT 7.0 A	BATTERY SYSTEMS/SERVICE								
	Demonstrated ability to interpret battery ratings.								
	Inspected and cleaned a battery.								
	Tested a battery with a hydrometer.								
	Tested a battery with a high rate discharge tester.								
	Performed a 3-minutes battery test.								
	Charged a battery.								
	Hooked up jumper cables correctly.								
UNIT 7.0 B	CHARGING SYSTEMS/SERVICE								
	Performed charging voltage output test with a voltmeter and evaluated findings.								
	Checked and adjusted alternator drive belt.								
	Performed charging system output test. (Used shop job sheet)								
	R/R alternator--generator.								
	R/R regulator.								
	Bench tested alternator and repaired as needed.								
UNIT 7.0 C	STARTING SYSTEMS/SERVICE								
	Performed starter current draw test.								
	Performed cranking voltage test.								
	Performed voltage drop test on starter cables.								
	Performed voltage drop test and continuity test on relays, solenoid, neutral safety switch.								
	Demonstrated ability to test armature and field windings with a growler.								
	R/R starter.								
UNIT 7.0 D	ELECTRICITY SYSTEMS/SERVICE								
	Performed continuity test.								
	Measured voltage drop across a component or connection.								
	Measured current flow in a circuit.								
	Measured resistance of a component.								
	Tested a diode and evaluated finding.								
	Soldered a splice and installed terminals and connectors.								
	Set up headlamp alignment equipment and evaluated readings.								
	Aligned headlamps. (single and/or dual)								
	Performed operational inspection of lighting system.								
	R/R flasher units.								
	Located and repaired shorts and opens in electrical circuits.								

		Proficiency Level 0	Level 1	Level 2	Level 3	Level 4	Date Completed	Instructor's Initials	Student's Initials
UNIT 7.0 E	IGNITION SYSTEMS/SERVICE								
	R/R spark plugs, clean, gap, and test.								
	R/R distributor points and condenser.								
	R/R distributor.								
	Removed and inspected distributor cap, rotor and cables.								
	Tested coil polarity and voltage output.								
	Demonstrated ability to trace a primary circuit.								
	Demonstrated ability to trace a firing order.								
UNIT 7.0 F	TUNE UP SYSTEMS/SERVICE								
	Performed minor tune-up and adjust according to manufacture specifications using hand held test equipment: timing light, tach-dwell, vacuum gauge.								
	Performed steps of major tune-up according to manufacturer specifications using an engine analyzer.								
	Checked distributor functions with distributor tester (option).								
	Performed infrared exhaust test and explained findings.								
UNIT 8.0 A	POWER TRAIN SYSTEMS/SERVICE								
	Changed rear axle lubricant.								
	Inspected and repaired universal joint.								
	R/R rear axle shaft and seal.								
	R/R drive shaft.								
Unit 8.0 B	TRANSMISSION, MANUAL								
	Adjust a clutch.								
	R/R clutch components.								
UNIT 8.0 C	TRANSMISSION, AUTOMATIC								
	Adjust and service automatic transmission.								
	R/R automatic transmission and components.								
	Overhaul automatic transmission.								
UNIT 9.0	TIRES AND WHEELS SYSTEMS/SERVICE								
	Demonstrated knowledge of tire nomenclature. (test)								
	Demonstrated ability to use tire changer: Manual								
	Demonstrated ability to use tire changer: Automatic								
	Performed tire balancing: Bubble								
	Performed tire balancing: Spin								
UNIT 10.0	SUSPENSION SYSTEMS/SERVICE								
	Lubricate suspension system.								
	Performed pre-alignment inspection for defective parts.								
UNIT 11.0	BRAKES SYSTEMS/SERVICE								
	Performed operational brake inspection.								
	R/R drum brake assembly.								
	Inspected and refinished brake drums.								
	Repaired wheel cylinder.								
	Replaced brake hoses, hydraulic lines, and fittings.								
	R/R wheel cylinder.								
	R/R master cylinder.								
	Inspected and replaced disc brake pads.								
	Inspected and refinished rotor. (Disc)								
	Repaired disc brake caliper.								
	Demonstrated correct procedure to bleed hydraulic brakes.								

		Proficiency							
		Level 0	Level 1	Level 2	Level 3	Level 4	Date Completed	Instructor' Initials	Student's Initials
UNIT 12.0	Performed LEVEL I service: Lubrication, tire repair, brake adjustment.								
	Performed LEVEL II service: Minor repairs and tune-ups, R/R minor components, minor adjustments... typical of apprentice mechanic with one year of experience.								
	Performed LEVEL III repairs such as over hauled automotive systems, tested and diagnosed system and component malfunctions. R/R: carburetor, transmission, engine, electrical-ignition systems, etc. Entry level mechanic with two years experience.								

Narrative of Exact Skill Experiences of this Student:

UNIT 13.0	Adjusted diesel fuel injection system.								
	R/R diesel fuel injection system injectors, Filters.								
	R/R and time fuel injection pump.								
	Calibrate diesel governor.								

PART VII

USE TEST RESULTS TO REFINE VOCATIONAL TRAINING

Outcome-referenced tests are designed to measure job-relevant objectives. The objectives indicate what should be taught.

It is important that outcome-referenced tests not be constructed or revised to measure what has been taught rather than what should be taught.

If students do not perform as expected on "outcome-referenced tests," there may be a temptation to alter the design of the test to "look good." A typical method of altering tests to obtain more favorable appearances is to lower the standards of performance and, as a result, to lower the test requirements. It is important not to lower valid standards!

If necessary, a test can be redesigned to better evaluate student performance or knowledges while retaining the standards that have been recommended by industry and experts as essential to skilled entry-level job success.

Valid program objectives, competency standards, and "outcome-referenced tests" are essential "quality controls" in the development of vocational skills and knowledges.

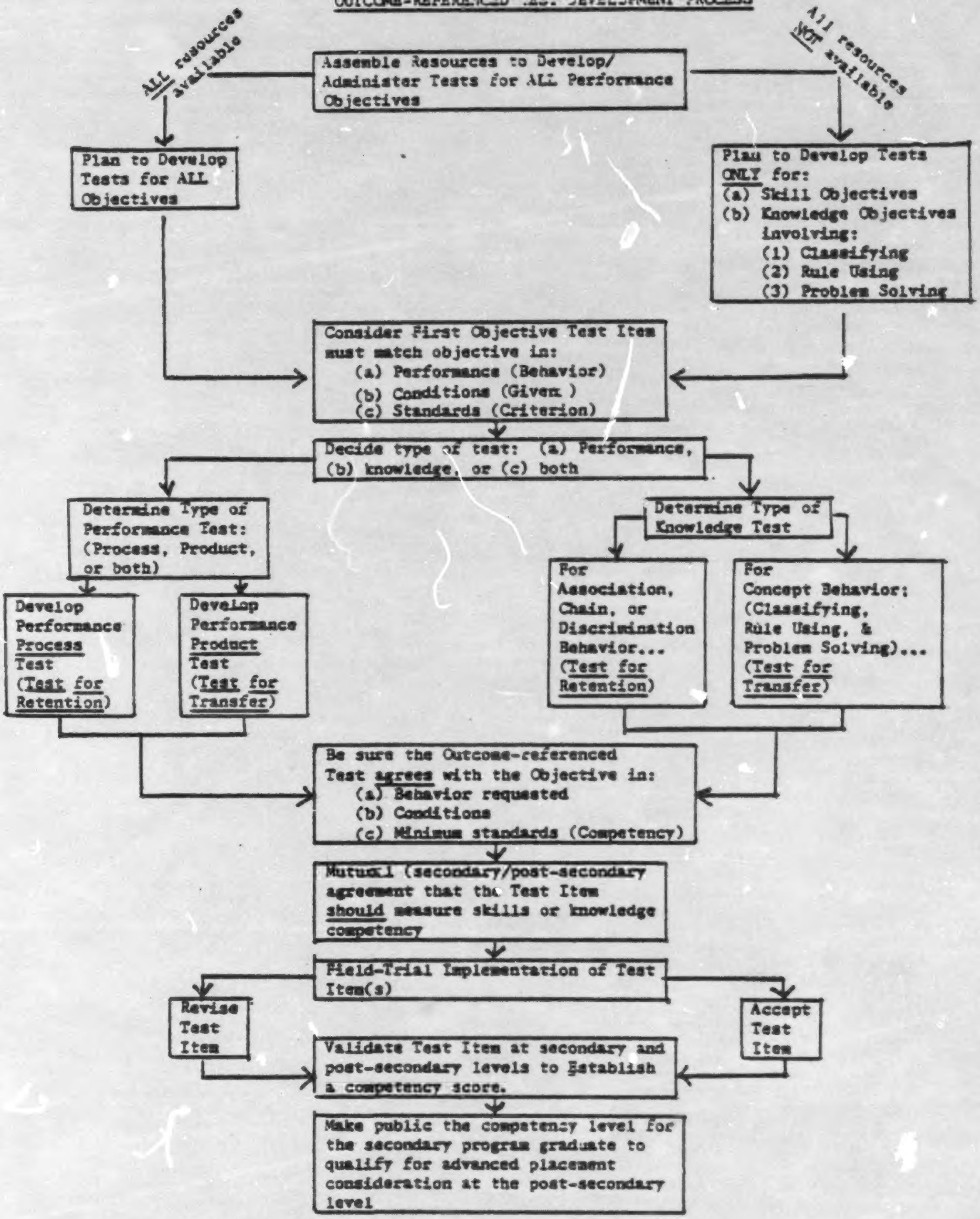
The following suggestions are a few of the ways in which "outcome-referenced test" results may be used to increase the validity and effectiveness of a vocational education program:

> Tests may be used as a template to evaluate a vocational program to determine if students are learning the desired occupational skills, knowledges, and attitudes.
>
> Tests results may be used to check the sequence in which the skills (e.g., steps in a task) are presented to determine if the learning sequence is instructionally (not intellectually) logical.
>
> Tests may be used to help determine if the skills are being presented in a variety of contexts to emphasize their usefulness and demonstrate their transferability.
>
> Tests may be used to help determine if there is sufficient repetition and whether there are enough opportunities for practice so that students become proficient in skills rather than merely familiar with them.
>
> Tests may be used to gauge if students are mastering minimum competencies in transferable skills, if the reading level is appropriate, if a greater number of examples from a variety of settings is needed, or if exercises and drills are accomplishing their purposes.
>
> In addition, test results may be used to reveal teaching practices that may need to be modified. Tests may help identify if the curriculum guide is not being followed or if more provisions must be made for individual differences among students.
>
> Test results should be used to help evaluate the efficiency and effectiveness of the vocational program and to help modify instruction so that program objectives will be realized.

PART VIII

SCHEMATIC OUTCOME-REFERENCED TEST DEVELOPMENT PROCESS

RECOMMENDED SEQUENCE
OUTCOME-REFERENCED TEST DEVELOPMENT PROCESS


ALL resources available
All resources NOT available
Assemble Resources to Develop/ Administer Tests for ALL Performance Objectives
Plan to Develop Tests for ALL Objectives
Plan to Develop Tests ONLY for:
(a) Skill Objectives
(b) Knowledge Objectives involving:
(1) Classifying
(2) Rule Using
(3) Problem Solving
Consider First Objective Test Item must match objective in:
(a) Performance (Behavior)
(b) Conditions (Given)
(c) Standards (Criterion)
Decide type of test: (a) Performance, (b) knowledge, or (c) both
Determine Type of Performance Test: (Process, Product, or both)
Determine Type of Knowledge Test
Develop Performance Process Test (Test for Retention)
Develop Performance Product Test (Test for Transfer)
For Association, Chain, or Discrimination Behavior... (Test for Retention)
For Concept Behavior: (Classifying, Rule Using, & Problem Solving)... (Test for Transfer)
Be sure the Outcome-referenced Test agrees with the Objective in:
(a) Behavior requested
(b) Conditions
(c) Minimum standards (Competency)
Mutual (secondary/post-secondary agreement that the Test Item should measure skills or knowledge competency
Field-Trial Implementation of Test Item(s)
Revise Test Item
Accept Test Item
Validate Test Item at secondary and post-secondary levels to Establish a competency score.
Make public the competency level for the secondary program graduate to qualify for advanced placement consideration at the post-secondary level

"Schematic" of outcome-referenced test development process of Occupational Education Articulation Program* developed by Wm. Edward Henderson Jr. 1982.
*Articulation is accomplished using a limited competency-based vocational education (CBVE) curriculum description.

PART IX

CONCLUSIONS AND RECOMMENDATIONS
OUTCOME-REFERENCED TEST DEVELOPMENT

Test samples are included in the articulated, performance-based instruction guides for the following reasons:

1. Standardization in evaluation procedures and test items is necessary in performance-based instruction to ensure that the vocational program graduate is job qualified by employer standards.

2. Outcome-referenced tests will indicate if the secondary level graduate has achieved the competency levels for which advanced credit may be awarded at the post-secondary level.

3. Outcome-referenced testing helps to determine if the instructional program activities are as effective as they might be in preparing the vocational student for entry-level job success.

4. Standardized tests help to ensure that evaluation procedures do not vary widely between individual teachers (lateral articulation).

The sample tests of the articulated, performance-based instruction guides are selected to measure major performance (task) areas only. Specific test items will continue to be developed at the classroom level promoting instructor flexibility and individuality.

Sample tests are articulated between instructors (laterally and vertically) and between instructor and students to indicate how student competency may be evaluated with validity and reliability.

Articulation does not compromise the sample test items. In fact, sample test items could serve as a study guide for students. Repeated use of the test items is possible since the student should understand that job qualification will be determined by evaluation of the student's job/task performance competencies.

Additional reliability may result if outcome-referenced measurement is accomplished at a centralized location or by a person other than the course instructor. The latter suggestion could involve no additional expense and could be conducted at the school site level. Using objective persons to administer tests might provide a check on adherence to instructional content and performance standards, reduce bias possibilities, add validity to the evaluation, and provide a means for quality control of vocational education.

If valid and reliable measures are used to evaluate secondary students as job qualified in one or more articulated vocational areas, the students should be considered qualified to be awarded credit at the post-secondary level for very similar articulated courses without further testing. The credit may be awarded provided the following conditions are met: (1) The student must enroll in the advanced phases of the TEC vocational course within a certain time limit. (2) The outcome-referenced test should have been validated and proven reliable.

In summary, there should be adherence to the use of outcome-referenced evaluation following closely the test samples developed by the task force committee. There should be some method of checking the validity and reliability of the tests on a periodic basis. There should be recognition in standard personnel management terms when a student masters job qualification standards and there should be a performance report of the secondary level attainment and post-secondary level advanced status earned.

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APPENDIXES

Appendix A	Suggested Timetable
Appendix B	Suggested Agenda

Appendix A

SUGGESTED TIMETABLE

WORKSHOP

(DEVELOPING OUTCOME-REFERENCED MEASURES)

Date: ____

Location: ____

TIMETABLE:

8:30 a.m.	Workshop begins
9:00 a.m.	Review of Participant's Guide
	Review of sample outcome-referenced test items
	Questions concerning writing outcome-referenced measures
	Organization of Working Sessions
	Working Sessions begin
11:30 - 12:30 p.m.	Participant's are on their own for lunch
12:30 p.m.	Working Sessions resumes
3:10 p.m.	Review of accomplishments of session
	Questions concerning outcome-referenced measures
	Task description for next meeting
	Scheduling of next meeting (date, time, location)
	Statement of what to bring to next meeting
3:30 p.m.	Workshop and Working Session concludes

This workshop is based on a six (6) hour working day for teacher participants.

SUGGESTED AGENDA

WORKSHOP: DEVELOPING OUTCOME-REFERENCED TESTS

1. Greeting, registration of Task Force Committee participant's (8:30 a.m.)
2. In-service credit announcement
3. Orientation to purpose of Workshop (Writing outcome-referenced measures)
4. Workshop outline
5. Tasks of Task Force Committee(s)
6. a. Distribute "Participant's Guide" (approximately at 9:00 a.m.)

    b. Review guide by tape recording
7. Sample outcome-referenced test items
8. Questions concerning writing outcome-referenced measures
9. Organization of Working Session

    a. Divide into groups, as appropriate

    b. Restatement of specific tasks of committee(s)
10. Working Session

    (There will be a lunch break at 11:30 a.m. to 12:30 p.m. with participant's on their own for lunch.)
11. Assignment of tasks for next meeting
12. Scheduling of next meeting(s)
13. Workshop concludes at 3:30 p.m.